IN THE SUPREME COURT OF THE STATE OF NEVADA

Case No. 84345
and
Case No. 84640

CITY OF LAS VEGAS, a political subdivision of the State of Nevada,

Appellant

v.

180 LAND CO, LLC, a Nevada limited-liability company, FORE STARS LTD., a Nevada limited liability company,

Respondents

District Court Case No.: A-17-758528-J
Eighth Judicial District Court of Nevada

CITY OF LAS VEGAS' REPLY APPENDIX VOLUME 4

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CHRONOLOGICAL INDEX TO CITY'S REPLY APPENDIX

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-09-13	Defendant City of Las Vegas' Second Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine Volume 32, Case No. A-18-773268-C	2	REPLY APP 0396 - REPLY APP 0432
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 34, Case No. A-18-773268-C	3	REPLY APP 0433 - REPLY APP 0652
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 35, Case No. A-18-773268-C	4 5	REPLY APP 0653 - REPLY APP 0902 REPLY APP 0903 - REPLY APP 0907
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 36, Case No. A-18-773268-C	5	REPLY APP 0908 - REPLY APP 1096
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 37, Case No. A-18-773268-C	6	REPLY APP 1097 - REPLY APP 1240

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 38, Case No. A-18-773268-C	7	REPLY APP 1241 - REPLY APP 1406
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 39, Case No. A-18-773268-C	7	REPLY APP 1407 - REPLY APP 1476
2023-01-23	Defendant City of Las Vegas' Appendix of Exhibits in Support of Motion to Retax Memorandum of Costs, Volume 1, Exhibits B - C, Case No. A-18-773268-C	8	REPLY APP 1477 - REPLY APP 1667
2022-09-12	Plaintiff Landowners Second Supplement to Appendix of Exhibits in Support of Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief Volume 24, Excerpt from Exhibit 228, Case No. A-18-773268-C	9	REPLY APP 1668 - REPLY APP 1742

ALPHABETICAL INDEX TO CITY'S REPLY APPENDIX

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 36, Case No. A-18-773268-C	5	REPLY APP 0908 - REPLY APP 1096
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 37, Case No. A-18-773268-C	6	REPLY APP 1097 - REPLY APP 1240
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 38, Case No. A-18-773268-C	7	REPLY APP 1241 - REPLY APP 1406
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 39, Case No. A-18-773268-C	7	REPLY APP 1407 - REPLY APP 1476
2022-09-12	Plaintiff Landowners Reply Re: Plaintiff Landowners' Motion to Determine Take and For Summary Judgment on the Third and Fifth Claims for Relief, Case No. A-18-773268-C	2	REPLY APP 0365 - REPLY APP 0395

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-09-12	Plaintiff Landowners Second Supplement to Appendix of Exhibits in Support of Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief Volume 24, Excerpt from Exhibit 228, Case No. A-18-773268-C	9	REPLY APP 1668 - REPLY APP 1742
2022-08-11	Plaintiff Landowners' Appendix of Exhibits in Support of: Plaintiff Landowners' Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief, Volume 22, Exhibit 214, Case No. A-18-773268-C	1	REPLY APP 0031 - REPLY APP 0227
2022-08-10	Plaintiff Landowners' Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief, Case No. A-18-773268-C	1	REPLY APP 0001 - REPLY APP 0030

DATED this 2nd day of May, 2023.

BY: /s/ Debbie Leonard

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Attorneys for City of Las Vegas

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I am an employee of Leonard Law, PC, and that on this date a copy of Appendix Volumes 2-9 were electronically filed with the Clerk of the Court for the Nevada Supreme Court by using the Nevada Supreme Court's E-Filing system (E-Flex). Participants in the case who are registered with E-Flex as users will be served by the E-Flex system. All others will be served by U.S. mail.

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Dated: May 2, 2023

/s/ Tricia Trevino

Tricia Trevino

Electronically Filed
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DISTRICT COURT

CLARK COUNTY, NEVADA

FORE STARS, LTD, SEVENTY ACRES, LLC, a Nevada limited liability company, DOE INDIVIDUALS I through X, DOE CORPORATIONS I through X, DOE LIMITED LIABILITY COMPANIES I through X, Plaintiffs, CITY OF LAS VEGAS, political subdivision of the State of Nevada, THE EIGHTH JUDICIAL DISTRICT COURT, County of Clark, State of Nevada, DEPARTMENT 24 (the HONORABLE JIM CROCKETT, DISTRICT COURT JUDGE, IN HIS OFFICIAL CAPACITY), ROE government entities I through X, ROE Corporations I through X, ROE INDIVIDUALS I through X, ROE LIMITED LIABILITY COMPANIES I through X, ROE quasi-governmental entities I through X, Defendants.	Case No. A-18-773268-C Dept. No. XXIX **SUPPLEMENTAL APPENDIX OF EXHIBITS IN SUPPORT OF CITY'S COUNTERMOTION FOR SUMMARY JUDGMENT ON JUST COMPENSATION** **VOLUME 35**

The City of Las Vegas ("City") submits this Supplemental Appendix of Exhibits in support of its Countermotion for Summary Judgment on Just Compensation. This appendix supplements the Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed August 11, 2022 (Volumes 1 through 25); the Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed August 24, 2022 (Volumes 26

through 27); the Second Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed September 12, 2022 (Volumes 28 through 32); and the Third Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed September 14, 2022 (Volume 33).

Exhibit	Exhibit Description	Vol.	Bates No.
A	City records regarding William Peccole's Petition to Annex 2,246 acres to the City of Las Vegas	1	0001-0011
B	City records regarding the Peccole Land Use Plan and the Z-34-81 rezoning application	1	0012-0030
C	City records regarding the Venetian Foothills Master Plan and the Z-30-86 rezoning application	1	0031-0050
D	Excerpts of the 1985 City of Las Vegas General Plan	1	0051-0061
E	City records regarding Peccole Ranch Master Plan and phase I rezoning application (Z-139-88)	1	0062-0106
F	City records regarding Z-40-89 rezoning application	1	0107-0113
G	Ordinance No. 3472 (establishing the Gaming Enterprise District) and related records	1	0114-0137
H	City records regarding the Amended Peccole Ranch Master Plan and phase II rezoning application (Z-17-90)	1	0138-0194
I	Excerpts of 1992 City of Las Vegas General Plan	2	0195-0248
J	City records related to Badlands Golf Course expansion	2	0249-0254
K	Excerpt of land use case files for GPA-24-98 and GPA-6199	2	0255-0257
L	Ordinance No. 5250 and Excerpts of Las Vegas 2020 Master Plan	2	0258-0273
M	Miscellaneous Southwest Sector Land Use Maps from 2002-2005	2	0274-0277
N	Ordinance No. 5787 and Excerpts of 2005 Land Use Element	2	0278-0291
O	Ordinance No. 6056 and Excerpts of 2009 Land Use & Rural Neighborhoods Preservation Element	2	0292-0301
P	Ordinance No. 6152 and Excerpts of 2012 Land Use & Rural Neighborhoods Preservation Element	2	0302-0317
Q	Ordinance No. 6622 and Excerpts of 2018 Land Use & Rural Neighborhoods Preservation Element	2	0318-0332
R	Ordinance No. 1582	2	0333-0339
S	Ordinance No. 4073 and Excerpt of the 1997 City of Las Vegas Zoning Code	2	0340-0341

Exhibit	Exhibit Description	Vol.	Bates No.
T	Ordinance No. 5353	2	0342-0361
U	Ordinance No. 6135 and Excerpts of City of Las Vegas Unified Development Code adopted March 16, 2011	2	0362-0364
V	Deeds transferring ownership of the Badlands Golf Course	2	0365-0377
W	Third Revised Justification Letter regarding the Major Modification to the 1990 Conceptual Peccole Ranch Master Plan	2	0378-0381
X	Parcel maps recorded by the Developer subdividing the Badlands Golf Course	3	0382-0410
Y	EHB Companies promotional materials	3	0411-0445
Z	General Plan Amendment (GPA-62387), Rezoning (ZON-62392) and Site Development Plan Review (SDR-62393) applications	3	0446-0466
AA	Staff Report regarding 17-Acre Applications	3	0467-0482
BB	Major Modification (MOD-63600), Rezoning (ZON-63601), General Plan Amendment (GPA-63599), and Development Agreement (DIR-63602) applications	3	0483-0582
CC	Letter requesting withdrawal of MOD-63600, GPA-63599, ZON-63601, DIR-63602 applications	4	0583
DD	Transcript of February 15, 2017 City Council meeting	4	0584-0597
EE	Judge Crockett's March 5, 2018 order granting Queensridge homeowners' petition for judicial review, Case No. A-17-752344-J	4	0598-0611
FF	Docket for NSC Case No. 75481	4	0612-0623
GG	Complaint filed by Fore Stars Ltd. and Seventy Acres LLC, Case No. A-18-773268-C	4	0624-0643
HH	General Plan Amendment (GPA-68385), Site Development Plan Review (SDR-68481), Tentative Map (TMP-68482), and Waiver (68480) applications	4	0644-0671
II	June 21, 2017 City Council meeting minutes and transcript excerpt regarding GPA-68385, SDR-68481, TMP-68482, and 68480.	4	0672-0679
JJ	Docket for Case No. A-17-758528-J	4	0680-0768
KK	Judge Williams' Findings of Fact and Conclusions of Law, Case No. A-17-758528-J	5	0769-0793
LL	Development Agreement (DIR-70539) application	5	0794-0879
MM	August 2, 2017 City Council minutes regarding DIR-70539	5	0880-0882

Exhibit	Exhibit Description	Vol.	Bates No.
NN	Judge Sturman's February 15, 2019 minute order granting City's motion to dismiss, Case No. A-18-775804-J	5	0883
OO	Excerpts of August 2, 2017 City Council meeting transcript	5	0884-0932
PP	Final maps for Amended Peccole West and Peccole West Lot 10	5	0933-0941
QQ	Excerpt of the 1983 Edition of the Las Vegas Municipal Code	5	0942-0951
RR	Ordinance No. 2185	5	0952-0956
SS	1990 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0957
TT	1996 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0958
UU	1998 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0959
VV	2015 aerial photograph identifying Phase I and Phase II boundaries, retail development, hotel/casino, and Developer projects, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0960
WW	2015 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0961
XX	2019 aerial photograph identifying Phase I and Phase II boundaries, and current assessor parcel numbers for the Badlands property, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0962
YY	2019 aerial photograph identifying Phase I and Phase II boundaries, and areas subject to inverse condemnation litigation, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0963
ZZ	2019 aerial photograph identifying areas subject to proposed development agreement (DIR-70539), produced by the City's Planning & Development	5	0964

Exhibit	Exhibit Description	Vol.	Bates No.
	Department, Office of Geographic Information Systems (GIS)		
AAA	Membership Interest Purchase and Sale Agreement	6	0965-0981
BBB	Transcript of May 16, 2018 City Council meeting	6	0982-0998
CCC	City of Las Vegas' Amicus Curiae Brief, *Seventy Acres, LLC v. Binion*, Nevada Supreme Court Case No. 75481	6	0999-1009
DDD	Nevada Supreme Court March 5, 2020 Order of Reversal, *Seventy Acres, LLC v. Binion*, Nevada Supreme Court Case No. 75481	6	1010-1016
EEE	Nevada Supreme Court August 24, 2020 Remittitur, *Seventy Acres, LLC v. Binion*, Nevada Supreme Court Case No. 75481	6	1017-1018
FFF	March 26, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlements on 17 Acres	6	1019-1020
GGG	September 1, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Final Entitlements for 435-Unit Housing Development Project in Badlands	6	1021-1026
HHH	Complaint Pursuant to 42 U.S.C. § 1983, *180 Land Co. LLC et al. v. City of Las Vegas, et al.*, 18-cv-00547 (2018)	6	1027-1122
III	9th Circuit Order in *180 Land Co. LLC; et al v. City of Las Vegas, et al.*, 18-cv-0547 (Oct. 19, 2020)	6	1123-1127
JJJ	Plaintiff Landowners' Second Supplement to Initial Disclosures Pursuant to NRCP 16.1 in 65-Acre case	6	1128-1137
LLL	Bill No. 2019-48: Ordinance No. 6720	7	1138-1142
MMM	Bill No. 2019-51: Ordinance No. 6722	7	1143-1150
NNN	March 26, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlement Requests for 65 Acres	7	1151-1152
OOO	March 26, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlement Requests for 133 Acres	7	1153-1155

Exhibit	Exhibit Description	Vol.	Bates No.
PPP	April 15, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlement Requests for 35 Acres	7	1156-1157
QQQ	Valbridge Property Advisors, Lubawy & Associates Inc., Appraisal Report (Aug. 26, 2015)	7	1158-1247
RRR	Notice of Entry of Order Adopting the Order of the Nevada Supreme Court and Denying Petition for Judicial Review	7	1248-1281
SSS	Letters from City of Las Vegas Approval Letters for 17-Acre Property (Feb. 16, 2017)	8	1282-1287
TTT	Reply Brief of Appellants 180 Land Co. LLC, Fore Stars, LTD,, Seventy Acres LLC, and Yohan Lowie in *180 Land Co LLC et al v. City of Las Vegas*, Court of Appeals for the Ninth Circuit Case No. 19-16114 (June 23, 2020)	8	1288-1294
UUU	Excerpt of Reporter's Transcript of Hearing on City of Las Vegas' Motion to Compel Discovery Responses, Documents and Damages Calculation and Related Documents on Order Shortening Time in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No. A-17-758528-J (Nov. 17, 2020)	8	1295-1306
VVV	Plaintiff Landowners' Sixteenth Supplement to Initial Disclosures in *180 Land Co., LLC v. City of Las Vegas*, Eighth Judicial District Court Case No. A-17-758528-J (Nov. 10, 2020)	8	1307-1321
WWW	Excerpt of Transcript of Las Vegas City Council Meeting (Aug. 2, 2017)	8	1322-1371
XXX	Notice of Entry of Findings of Facts and Conclusions of Law on Petition for Judicial Review in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-17-758528-J (Nov. 26, 2018)	8	1372-1399
YYY	Notice of Entry of Order *Nunc Pro Tunc* Regarding Findings of Fact and Conclusion of Law Entered November 21, 2019 in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-17-758528 (Feb. 6, 2019)	8	1400-1405
ZZZ	City of Las Vegas Agenda Memo – Planning, for City Council Meeting June 21, 2017, Re: GPA-68385, WVR-68480, SDR-68481, and TMP-68482 [PRJ-67184]	8	1406-1432

Exhibit	Exhibit Description	Vol.	Bates No.
AAAA	Excerpts from the Land Use and Rural Neighborhoods Preservation Element of the City's 2020 Master Plan adopted by the City Council of the City on September 2, 2009	8	1433-1439
BBBB	Summons and Complaint for Declaratory Relief and Injunctive Relief, and Verified Claims in Inverse Condemnation in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-18-780184-C	8	1440-1477
CCCC	Notice of Entry of Findings of Fact and Conclusions of Law Granting City of Las Vegas' Motion for Summary Judgment in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-18-780184-C (Dec. 30, 2020)	8	1478-1515
DDDD	Peter Lowenstein Declaration	9	1516-1522
DDDD-1	Exhibit 1 to Peter Lowenstein Declaration: Diagram of Existing Access Points	9	1523-1526
DDDD-2	Exhibit 2 to Peter Lowenstein Declaration: July 5, 2017 Email from Mark Colloton	9	1527-1531
DDDD-3	Exhibit 3 to Peter Lowenstein Declaration: June 28, 2017 Permit application	9	1532-1533
DDDD-4	Exhibit 4 to Peter Lowenstein Declaration: June 29, 2017 Email from Mark Colloton re Rampart and Hualapai	9	1534-1536
DDDD-5	Exhibit 5 to Peter Lowenstein Declaration: August 24, 2017 Letter from City Department of Planning	9	1537
DDDD-6	Exhibit 6 to Peter Lowenstein Declaration: July 26, 2017 Email from Peter Lowenstein re Wall Fence	9	1538
DDDD-7	Exhibit 7 to Peter Lowenstein Declaration: August 10, 2017 Application for Walls, Fences, or Retaining Walls; related materials	9	1539-1546
DDDD-8	Exhibit 8 to Peter Lowenstein Declaration: August 24, 2017 Email from Steve Gebeke	9	1547-1553
DDDD-9	Exhibit 9 to Peter Lowenstein Declaration: Bill No. 2018-24	9	1554-1569
DDDD-10	Exhibit 10 to Peter Lowenstein Declaration: Las Vegas City Council Ordinance No. 6056 and excerpts from Land Use & Rural Neighborhoods Preservation Element	9	1570-1577

Exhibit	Exhibit Description	Vol.	Bates No.
DDDD-11	Exhibit 11 to Peter Lowenstein Declaration: documents submitted to Las Vegas Planning Commission by Jim Jimmerson at February 14, 2017 Planning Commission meeting	9	1578-1587
EEEE	GPA-72220 application form	9	1588-1590
FFFF	Chris Molina Declaration	9	1591-1605
FFFF-1	Fully Executed Copy of Membership Interest Purchase and Sale Agreement for Fore Stars Ltd.	9	1606-1622
FFFF-2	Summary of Communications between Developer and Peccole family regarding acquisition of Badlands Property	9	1623-1629
FFFF-3	Reference map of properties involved in transactions between Developer and Peccole family	9	1630
FFFF-4	Excerpt of appraisal for One Queensridge place dated October 13, 2005	9	1631-1632
FFFF-5	Site Plan Approval for One Queensridge Place (SDR-4206)	9	1633-1636
FFFF-6	Securities Redemption Agreement dated September 14, 2005	9	1637-1654
FFFF-7	Securities Purchase Agreement dated September 14, 2005	9	1655-1692
FFFF-8	Badlands Golf Course Clubhouse Improvement Agreement dated September 6, 2005	9	1693-1730
FFFF-9	Settlement Agreement and Mutual Release dated June 28, 2013	10	1731-1782
FFFF-10	June 12, 2014 emails and Letter of Intent regarding the Badlands Golf Course	10	1783-1786
FFFF-11	July 25, 2014 email and initial draft of Golf Course Purchase Agreement	10	1787-1813
FFFF-12	August 26, 2014 email from Todd Davis and revised purchase agreement	10	1814-1843
FFFF-13	August 27, 2014 email from Billy Bayne regarding purchase agreement	10	1844-1846
FFFF-14	September 15, 2014 email and draft letter to BGC Holdings LLC regarding right of first refusal	10	1847-1848

Exhibit	Exhibit Description	Vol.	Bates No.
FFFF-15	November 3, 2014 email regarding BGC Holdings LLC	10	1849-1851
FFFF-16	November 26, 2014 email and initial draft of stock purchase and sale agreement	10	1852-1870
FFFF-17	December 1, 2015 emails regarding stock purchase agreement	10	1871-1872
FFFF-18	December 1, 2015 email and fully executed signature page for stock purchase agreement	10	1873-1874
FFFF-19	December 23, 2014 emails regarding separation of Fore Stars Ltd. and WRL LLC acquisitions into separate agreements	10	1875-1876
FFFF-20	February 19, 2015 emails regarding notes and clarifications to purchase agreement	10	1877-1879
FFFF-21	February 26, 2015 email regarding revised purchase agreements for Fore Stars Ltd. and WRL LLC	10	1880
FFFF-22	February 27, 2015 emails regarding revised purchase agreements for Fore Stars Ltd. and WRL LLC	10	1881-1882
FFFF-23	Fully executed Membership Interest Purchase Agreement for WRL LLC	10	1883-1890
FFFF-24	June 12, 2015 email regarding clubhouse parcel and recorded parcel map	10	1891-1895
FFFF-25	Quitclaim deed for Clubhouse Parcel from Queensridge Towers LLC to Fore Stars Ltd.	10	1896-1900
FFFF-26	Record of Survey for Hualapai Commons Ltd.	10	1901
FFFF-27	Deed from Hualapai Commons Ltd. to EHC Hualapai LLC	10	1902-1914
FFFF-28	Purchase Agreement between Hualapai Commons Ltd. and EHC Hualapai LLC	10	1915-1931
FFFF-29	City of Las Vegas' First Set of Interrogatories to Plaintiff	10	1932-1945
FFFF-30	Plaintiff 180 Land Company LLC's Responses to City of Las Vegas' First Set of Interrogatories to Plaintiff, 3rd Supplement	10	1946-1973
FFFF-31	City of Las Vegas' Second Set of Requests for Production of Documents to Plaintiff	11	1974-1981

Exhibit	Exhibit Description	Vol.	Bates No.
FFFF-32	Plaintiff 180 Land Company LLC's Response to Defendant City of Las Vegas' Second Set of Requests for Production of Documents to Plaintiff	11	1982-1989
FFFF-33	September 14, 2020 Letter to Plaintiff regarding Response to Second Set of Requests for Production of Documents	11	1990-1994
FFFF-34	First Supplement to Plaintiff Landowners Response to Defendant City of Las Vegas' Second Set of Requests for Production of Documents to Plaintiff	11	1995-2002
FFFF-35	Motion to Compel Discovery Responses, Documents and Damages Calculation, and Related Documents on Order Shortening Time	11	2003-2032
FFFF-36	Transcript of November 17, 2020 hearing regarding City's Motion to Compel Discovery Responses, Documents and Damages Calculation, and Related Documents on Order Shortening Time	11	2033-2109
FFFF-37	February 24, 2021 Order Granting in Part and denying in part City's Motion to Compel Discovery Responses, Documents and Damages Calculation, and Related Documents on Order Shortening Time	11	2110-2118
FFFF-38	April 1, 2021 Letter to Plaintiff regarding February 24, 2021 Order	11	2119-2120
FFFF-39	April 6, 2021 email from Elizabeth Ghanem Ham regarding letter dated April 1, 2021	11	2121-2123
FFFF-40	Hydrologic Criteria and Drainage Design Manual, Section 200	11	2124-2142
FFFF-41	Hydrologic Criteria and Drainage Design Manual, Standard Form 1	11	2143
FFFF-42	Hydrologic Criteria and Drainage Design Manual, Standard Form 2	11	2144-2148
FFFF-43	Email correspondence regarding minutes of August 13, 2018 meeting with GCW regarding Technical Drainage Study	11	2149-2152
FFFF-44	Excerpts from Peccole Ranch Master Plan Phase II regarding drainage and open space	11	2153-2159
FFFF-45	Aerial photos and demonstrative aids showing Badlands open space and drainage system	11	2160-2163
FFFF-46	August 16, 2016 letter from City Streets & Sanitation Manager regarding Badlands Golf Course Drainage Maintenance	11	2164-2166

Exhibit	Exhibit Description	Vol.	Bates No.
FFFF-47	Excerpt from EHB Companies promotional materials regarding security concerns and drainage culverts	11	2167
GGGG	Landowners' Reply in Support of Countermotion for Judicial Determination of Liability on the Landowners' Inverse Condemnation Claims Etc. in *180 Land Co., LLC v. City of Las Vegas*, Eighth Judicial District Court Case No. A-17-758528-J (March 21, 2019)	11	2168-2178
HHHH	June 28, 2016 Letter from Mark Colloton re: Reasons for Access Points Off Hualapai Way and Rampart Blvd.	12	2179-2184
IIII	Transcript of City Council Meeting (May 16, 2018)	12	2185-2260
JJJJ	Excerpt of April 8, 2021 Transcript of Hearing re Plaintiffs' Motion for a New Trial and to Amend (March 11, 2021), Case No. A-18-780184-C	12	2261-2266
KKKK	Affidavit of Donald Richards and accompanying photographs submitted by the Developer on April 15, 2021 in Case No. A-18-780184-C	13	2267-2428
LLLL	Supplemental Declaration of Seth T. Floyd	14	2429-2432
LLLL-1	1981 Peccole Property Land Use Plan	14	2433-
LLLL-2	1985 Las Vegas General Plan	14	2434-2515
LLLL-3	1975 General Plan	14	2516-2611
LLLL-4	Planning Commission meeting records regarding 1985 General Plan	15	2612-2839
LLLL-5	1986 Venetian Foothills Master Plan	15	2840
LLLL-6	1989 Peccole Ranch Master Plan	15	2841
LLLL-7	1990 Master Development Plan Amendment	15	2842
LLLL-8	Citizen's Advisory Committee records regarding 1992 General Plan	15	2843-2860
LLLL-9	1992 Las Vegas General Plan	16-17	2861-3310
LLLL-10	1992 Southwest Sector Map	18	3311
LLLL-11	Ordinance No. 5250 (Adopting 2020 Master Plan)	18	3312-3319

Exhibit	Exhibit Description	Vol.	Bates No.
LLLL-12	Las Vegas 2020 Master Plan	18	3320-3402
LLLL-13	Ordinance No. 5787 (Adopting 2005 Land Use Element)	18	3403-3469
LLLL-14	2005 Land Use Element	18	3470-3527
LLLL-15	Ordinance No. 6056 (Adopting 2009 Land Use and Rural Neighborhoods Preservation Element)	18	3528-3532
LLLL-16	2009 Land Use and Rural Neighborhoods Preservation Element	19	3533-3632
LLLL-17	Ordinance No. 6152 (Adopting revisions to 2009 Land Use and Rural Neighborhoods Preservation Element)	19	3633-3642
LLLL-18	Ordinance No. 6622 (Adopting 2018 Land Use and Rural Neighborhoods Preservation Element)	19	3643-3653
LLLL-19	2018 Land Use & Rural Neighborhoods Preservation Element	19	3654-3753
MMMM	State of Nevada State Board of Equalization Notice of Decision, *In the Matter of Fore Star Ltd., et al.* (Nov. 30, 2017)	20	3754-3758
NNNN	Clark County Real Property Tax Values	20	3759-3774
OOOO	Clark County Tax Assessor's Property Account Inquiry - Summary Screen	20	3775-3776
PPPP	February 22, 2017 Clark County Assessor Letter to 180 Land Co. LLC, re Assessor's Golf Course Assessment	20	3777
QQQQ	Petitioner's Opening Brief, *In the matter of 180 Land Co. LLC* (Aug. 29, 2017), State Board of Equalization	20	3778-3815
RRRR	September 21, 2017 Clark County Assessor Stipulation for the State Board of Equalization	20	3816
SSSS	Excerpt of Reporter's Transcript of Hearing in *180 Land Co. v. City of Las Vegas*, Eighth Judicial District Court Case No. A-17-758528-J (Feb. 16, 2021)	20	3817-3868
TTTT	June 28, 2016 Letter from Mark Colloton re: Reasons for Access Points Off Hualapai Way and Rampart Blvd.	20	3869-3874

Exhibit	Exhibit Description	Vol.	Bates No.
UUUU	Transcript of City Council Meeting (May 16, 2018)	20	3875-3950
VVVV	Supplemental declaration of Seth Floyd	21	3951-3953
VVVV-1	Southwest Sector Land Use Map (1992)	21	3954
VVVV-2	10/10/1991 Planning Commission Minutes	21	3955-3957
VVVV-3	10/22/1991 Planning Commission Minutes	21	3958-3962
VVVV-4	11/14/1991 Planning Commission Minutes	21	3963-3965
VVVV-5	11/26/1991 Planning Commission Minutes	21	3966-3968
VVVV-6	12/12/1991 Planning Commission Minutes	21	3969-3976
VVVV-7	12/12/1991 Planning Commission Resolution adopting 1992 General Plan	21	3977-3978
VVVV-8	2/5/1992 City Council Meeting Minutes	21	3979
VVVV-9	2/18/1992 Recommending Committee Meeting Minutes	21	3980-4000
VVVV-10	2/19/1992 City Council Meeting Minutes	21	4001-4002
VVVV-11	3/12/1992 Planning Commission Meeting Minutes	21	4003-4004
VVVV-12	3/16/1992 Recommending Committee Meeting Minute	21	4005
VVVV-13	4/1/1992 City Council Meeting Minutes	21	4006-4008
VVVV-14	Ordinance No. 3636 (adopting new general plan)	21	4009-4011

Exhibit	Exhibit Description	Vol.	Bates No.
VVVV-15	2/13/1992 Citizens Advisory Committee Meeting Minutes	21	4012-4015
VVVV-16	3/27/1991 Citizens Advisory Committee Mailout	21	4016-4025
WWWW	Excerpts of NRCP 30(b)(6) Designee of Peccole Nevada Corporation – William Bayne	21	4026-4039
XXXX	Findings of Facts, Conclusions of Law and Order Regarding Motion to Dismiss and Countermotion to Allow More Definite Statement if Necessary and Countermotion to Stay Litigation of Inverse Condemnation Claims Until Resolution of the Petition for Judicial Review and Countermotion for NRCP Rule 56(F) Continuance	21	4040-4051
YYYY	Declaration of Christopher Molina in Support of the City's Countermotion for Summary Judgment and Opposition to Motion to Determine Property Interest	21	4052-4053
ZZZZ	Declaration of Seth Floyd	21	4054-4055
ZZZZ -1	Master planned communities with R-PD zoning	21	4056-4061
ZZZZ -2	General Plan Maps for Master Planned Communities with R-PD zoning	21	4062-4067
AAAAA	Recorder's Amended Transcript of Pending Motions in *180 Land Company LLC, et al. vs. City of Las Vegas,* Eighth Judicial District Court Case No. A-18-775804 (September 17, 2021)	22	4068-4235
BBBBB	December 23, 2021 letter from Seth Floyd re Entitlements on 17-acre Property; Applications for development of other segments of former Badlands Golf Course	22	4236-4238
CCCCC	July 19, 2022 letter from Seth Floyd re Entitlements on 17-acre portion of Badlands	22	4239-4240
DDDDD	Appraisal of Real Property prepared by The DiFederico Group re the 17-Acre Property	23	4241-4394
EEEEE	Affidavit of Donald Richards (Ex. 50 to Plaintiff Landowners' Reply in Support of Countermotion for Discovery Pursuant to NRCP 56(d) filed 7/7/2021)	23	4395-4396
FFFFF	Bill No. 2018-5 (Ordinance No. 6617)	23	4397-4405

Exhibit	Exhibit Description	Vol.	Bates No.
GGGGG	Appraisal Consulting Report prepared by Charles E. Jack of Integra Realty Resources	24	4406-4586
HHHHH	Supplemental Declaration Peter Lowenstein	24	4587-4600
HHHHH-1	Email from Steve Swanton re PMP – 58526 and PMP-58527 (Queensridge/Badlands Golf Course)	24	4601-4602
HHHHH-2	June 8, 2015 letter to Angie Scott from Steve Swanton re PMP-59572	24	4603
HHHHH-3	Email from Stephanie Allen to Peter Lowenstein re Development Agreement	24	4604-4605
HHHHH-4	Email from Lucien Paet re New Badlands Parcel Map	24	4606
HHHHH-5	Approved Site Plan for SDR-62393	24	4607
IIIII	Declaration of Kevin McOsker	25	4608-4609
JJJJJ	Videotaped Deposition of Tio Stephan DiFederico, MAI	25	4610-4711
KKKKK	Appellant's Opening Brief filed 11/6/18 in Nevada Supreme Court Case No. 75481	26	4712-4791
LLLLL	Appellant's Amended Reply Brief filed 5/1/19 in Nevada Supreme Court Case No. 75481	26	4792-4829
MMMMM	City of Las Vegas's Motion for Summary Judgment filed 11/9/20 in the 65-Acre Case (No. A-18-780184-C)	26	4830-4862
NNNNN	Plaintiff Landowners' Opposition to the City's Motion for Summary Judgment Etc. filed 11/23/20 in the 65-Acre Case (No. A-18-780184-C)	26	4863-4950
OOOOO	City of Las Vegas' Motion to Remand 133-Acre Applications to the Las Vegas City Council filed 8/9/2021 in the 133-Acre Case (No. A-18-775804-J)	27	4951-4961
PPPPP	Notice of Entry of Findings of Fact, Conclusions of Law Regarding (1) Motion to Remand 133-Acre Applications to Las Vegas City Council and (2) Motion to Dismiss Civil Complaint Improperly Joined with Petition for Judicial Review	27	4962-4973

Exhibit	Exhibit Description	Vol.	Bates No.
QQQQQ	Deposition Transcript of Charles E. Jack, June 16, 2022	28	4974-5168
RRRRR	Deposition Transcript of NRCP 30(b)(6) Designee of Peccole Nevada Corporation – William Bayne	29	5169-5411
SSSSS	Order Granting the City of Las Vegas' Motion to Compel and for an Order to Show Cause in the 35-Acre Case (No. A-17-758528-J)	30	5412-5416
TTTTT	Order Granting the City of Las Vegas' Objection to the Discovery Commissioner's Report and Recommendation in the 35-Acre Case (No. A-17-758528-J)	30	5417-5422
UUUUU	Appraisal of Real Property prepared by The DiFederico Group re the 35-Acre Property	30	5423-5558
VVVVV	Excerpts of Deposition Transcript of Yohan Lowie	31	5559-5566
WWWWW	Declaration of Philip R. Byrnes in Support of City's Reply in Support of City's Renewed Motion for Summary Judgment and City's Motion to Strike Developer's Countermotion for Approval of Entitlements and to End Take	32	5567-5568
WWWWW-1	Agenda Summary Page for Item 28 of the August 3, 2022 Las Vegas City Council meeting	32	5569-5570
WWWWW-2	Settlement Proposal	32	5571-5583
XXXXX	Order Granting Stay	33	5584-5588
YYYYY	**Declaration of Oh-Sang Kwon**	**34**	**5589-5595**
YYYYY-1	**Technical Drainage Study for the Seventy 840-050 March 2016**	**34-35**	**5596-5982**
YYYYY-2	**Supplement to Technical Drainage Study for the Seventy 840-050 March 2016**	**35**	**5983-6024**
YYYYY-3	**March 24, 2016 City of Las Vegas Inter-Office Memorandum re Drainage Study for The Seventy**	**36**	**6025-6028**
YYYYY-4	**September 2017 Response to 1st CLV Comments on the Technical Drainage Study for the 435 (Formerly "The Seventy")**	**36**	**6029-6193**
YYYYY-5	**September 14, 2017 - Improvement Plans for the 435**	**37**	**6194-6210**
YYYYY-6	**March 24, 2016 City of Las Vegas Inter-Office Memorandum re Drainage Study for The Seventy**	**37**	**6211-6215**
YYYYY-7	**January 2018 Response to 2nd CLV Comments on the Technical Drainage Study for the 435 (Formerly "The Seventy")**	**37**	**6216-6292**

Exhibit	Exhibit Description	Vol.	Bates No.
YYYYY-8	**January 10, 2018 - Improvement Plans for the 435**	**37**	**6293-6309**
YYYYY-9	**February 1, 2018 City of Las Vegas Inter-Office Memorandum re Drainage Study for the 435 formerly the SEVENTY**	**37**	**6310-6314**
YYYYY-10	**June 2018 Response to 3rd CLV Comments on the Technical Drainage Study for the 435 (Formerly "The Seventy")**	**38**	**6315-6461**
YYYYY-11	**Improvement Plans for the 435**	**39**	**6462-6483**
YYYYY-12	**July 26, 2018 City of Las Vegas Inter-Office Memorandum re Drainage Study for the 435 formerly the Seventy**	**39**	**6484-6489**
YYYYY-13	**August 13, 2016 GCW Engineers Meeting Minutes**	**39**	**6490-6495**
YYYYY-14	**Email re The 435 TD5 Comments Review Meeting**	**39**	**6496-6499**
ZZZZZ	**Declaration of Michael Cunningham**	**39**	**6500**
ZZZZZ-1	**Administrative Code, 2019 Edition**	**39**	**6501-6507**

Dated this 23rd day of November, 2022.

McDONALD CARANO LLP

By: */s/ George F. Ogilvie III*

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Attorneys for City of Las Vegas

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I am an employee of McDonald Carano LLP, and that on the 23rd day of November, 2022, I caused a true and correct copy of the foregoing **FOURTH SUPPLEMENTAL APPENDIX OF EXHIBITS IN SUPPORT OF CITY'S COUNTERMOTION FOR SUMMARY JUDGMENT ON JUST COMPENSATION – VOLUME 35** to be electronically served with the Clerk of the Court via the Clark County District Court Electronic Filing Program which will provide copies to all counsel of record registered to receive such electronic notification.

/s/ Jelena Jovanovic
An employee of McDonald Carano LLP

33.580	.0100						.0140	.47	12.00	1.67	13.34	.015		.00	.00	BOX	
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26.177	.0102						.0263	.69	7.83	2.40	11.25	.015		.00	.00	BOX	

Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 3:30

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
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87.407	.0463					.0260	2.27	8.92	2.49	6.30	.015	.00	.00	BOX
-7605.950	2692.682	8.017	2700.698	4177.00	37.22	21.51	2722.21	.00	12.00	14.00	12.000	14.000	.00	0 .0
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-7519.010	2698.724	2.413	2701.137	2476.00	41.04	26.15	2727.29	1.82	6.73	25.00	9.000	25.000	.00	0 .0
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-7438.420	2704.825	4.694	2709.519	2476.00	37.67	22.04	2731.56	.86	9.00	14.00	9.000	14.000	.00	0 .0
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Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 3:30

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7395.662	2708.062	4.924	2712.985	2476.00	35.92	20.04	2733.02	.78	9.00	14.00	9.000	14.000	.00	0 .0
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-7198.058	2716.808	5.524	2722.333	2476.00	32.01	15.91	2738.25	.00	9.00	14.00	9.000	14.000	.00	0	.0
74.548	.0376						.0218	1.63	5.52	2.40	4.64	.015	.00	.00	BOX
-7123.510	2719.611	5.794	2725.405	2476.00	30.52	14.47	2739.87	.00	9.00	14.00	9.000	14.000	.00	0	.0
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-7111.230	2720.073	5.849	2725.921	2476.00	30.24	14.20	2740.12	.00	9.00	14.00	9.000	14.000	.00	0	.0
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-7058.136	2722.069	6.134	2728.203	2476.00	28.83	12.91	2741.11	.00	9.00	14.00	9.000	14.000	.00	0	.0
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-7016.901	2723.619	6.434	2730.053	2476.00	27.49	11.73	2741.79	.00	9.00	14.00	9.000	14.000	.00	0	.0
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Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 3:30

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6984.418	2724.841	6.748	2731.588	2476.00	26.21	10.67	2742.26	.00	9.00	14.00	9.000	14.000	.00	0 .0
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86.140	.0100					.0089	.76	7.86	1.41	7.55	.015	.00	.00	BOX
-6748.980	2728.902	7.961	2736.863	2476.00	22.22	7.66	2744.53	.00	9.00	14.00	9.000	14.000	.00	0 .0
JUNCT STR	.0100					.0091	.05	7.96	1.39		.015	.00	.00	BOX
-6743.980	2728.952	7.647	2736.599	2450.00	22.88	8.13	2744.73	.00	9.00	14.00	9.000	14.000	.00	0 .0
308.860	.0100					.0090	2.79	7.65	1.46	7.49	.015	.00	.00	BOX
-6435.121	2732.041	7.948	2739.989	2450.00	22.02	7.53	2747.52	.00	9.00	14.00	9.000	14.000	.00	0 .0
58.804	.0100					.0084	.49	7.95	1.38	7.49	.015	.00	.00	BOX
-6376.317	2732.629	8.056	2740.686	2450.00	21.72	7.33	2748.01	.00	9.00	14.00	9.000	14.000	.00	0 .0
122.954	.0100					.0078	.96	8.06	1.35	7.49	.015	.00	.00	BOX

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 3:30

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6253.363	2733.859	8.450	2742.308	2450.00	20.71	6.66	2748.97	.00	9.00	14.00	9.000	14.000	.00	0 .0
61.743	.0100					.0069	.42	8.45	1.26	7.49	.015	.00	.00	BOX

---------- WARNING - Flow depth near top of box conduit ----------

-6191.620	2734.476	8.862	2743.338	2450.00	19.75	6.06	2749.39	.00	9.00	14.00	9.000	14.000	.00	0 .0
12.660	.0100					.0063	.08	8.86	1.17	7.51	.015	.00	.00	BOX

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                    ------------------- WARNING - Flow depth near top of box conduit -------------------
-6178.960  2734.602   9.000  2743.602  2450.00  19.44   5.87  2749.47    .00   9.00   14.00   9.000  14.000   .00   0    .0
JUNCT STR    .0098                                        .0064     .03   9.00    1.14            .015    .00   .00  BOX
                    ------------------- WARNING - Flow depth near top of box conduit -------------------
-6173.960  2734.651  11.911  2746.562  2130.00  15.78   3.87  2750.43    .00   8.56   15.00   9.000  15.000   .00   0    .0
  25.340    .0099                                        .0064     .16  11.91     .93    6.33    .015    .00   .00  BOX
-6148.620  2734.902  11.822  2746.724  2130.00  15.78   3.87  2750.59    .00   8.56   15.00   9.000  15.000   .00   0    .0
  10.330    .0099                                        .0064     .07  11.82     .93    6.34    .015    .00   .00  BOX
-6138.290  2735.004  11.786  2746.790  2130.00  15.78   3.87  2750.66    .00   8.56   15.00   9.000  15.000   .00   0    .0
  80.110    .0099                                        .0064     .51    .00     .93    6.33    .015    .00   .00  BOX
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**********************************************************************************************************************************
 Station | Invert Elev | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head | Energy Grd.El. | Super Elev | Critical Depth | Flow Top Width | Height/Dia.-FT | Base Wt or I.D. | EL | No Wth Prs/Pip
 L/Elem | Ch Slope | ******** | ******** | ******** | ******* | SF Ave | HF | SE Dpth | Froude N | Norm Dp | "N" | X-Fall | ZR | Type Ch
**********************************************************************************************************************************
-6058.180  2735.797  12.026  2747.823  2130.00  15.78   3.87  2751.69    .00   8.56   15.00   9.000  15.000   .00   0    .0
 244.970    .0099                                        .0064    1.57  12.03     .93    6.33    .015    .00   .00  BOX
-5813.210  2738.222  11.166  2749.388  2130.00  15.78   3.87  2753.25    .00   8.56   15.00   9.000  15.000   .00   0    .0
  54.020    .0099                                        .0064     .35    .00     .93    6.33    .015    .00   .00  BOX
-5759.190  2738.757  11.408  2750.165  2130.00  15.78   3.87  2754.03    .00   8.56   15.00   9.000  15.000   .00   0    .0
TRANS STR    .0099                                        .0032     .04  11.41     .93            .015    .00   .00  BOX
-5747.190  2738.876  13.460  2752.336  2130.00  11.83   2.17  2754.51    .00   7.06   20.00   9.000  20.000   .00   0    .0
  49.000    .0099                                        .0032     .15  13.46     .70    4.89    .015    .00   .00  BOX
-5698.190  2739.361  13.129  2752.490  2130.00  11.83   2.17  2754.66    .00   7.06   20.00   9.000  20.000   .00   0    .0
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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC3-5.WSW   RRD
SO  -6176.4602735.940 72                          2746.562
R   -6125.5202738.258 72      .013                                35.000     .000 1
R   -5952.9902747.740 72      .013                                23.000     .000 1
R   -5743.8102759.237 72      .013                                13.000     .000 1
R   -5587.2202760.774 72      .013                                  .000     .000 1
JX  -5582.2202760.823 72 48          20.000          2760.800        50.0         0.000
R   -5379.4202762.815 72      .013                               -58.000     .000 1
R   -5286.5602763.873 72      .013                                  .000     .000 0
SH  -5286.5602763.873 72                          2773.753
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q           344.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC3-5.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6176.460	2735.940	10.622	2746.562	364.00	12.87	2.57	2749.14	.00	5.15	.00	6.000	.000	.00	0 .0
4.306	.0455					.0074	.03	.00	.00	2.65	.013	.00	.00	PIPE
-6172.154	2736.136	10.495	2746.631	364.00	12.87	2.57	2749.20	.00	5.15	.00	6.000	.000	.00	0 .0
HYDRAULIC JUMP														
-6172.154	2736.136	2.635	2738.771	364.00	30.45	14.40	2753.17	2.06	5.15	5.96	6.000	.000	.00	0 .0
46.634	.0455					.0465	2.17	4.69	3.79	2.65	.013	.00	.00	PIPE
-6125.520	2738.258	2.631	2740.890	364.00	30.51	14.45	2755.34	.40	5.15	5.95	6.000	.000	.00	0 .0
104.458	.0550					.0440	4.59	3.03	3.80	2.51	.013	.00	.00	PIPE
-6021.062	2743.999	2.723	2746.722	364.00	29.17	13.21	2759.93	.37	5.15	5.97	6.000	.000	.00	0 .0
68.071	.0550					.0388	2.64	3.09	3.56	2.51	.013	.00	.00	PIPE
-5952.991	2747.740	2.825	2750.565	364.00	27.81	12.01	2762.57	.16	5.15	5.99	6.000	.000	.00	0 .0
28.109	.0550					.0351	.99	2.98	3.32	2.51	.013	.00	.00	PIPE
-5924.882	2749.285	2.883	2752.168	364.00	27.08	11.39	2763.56	.15	5.15	6.00	6.000	.000	.00	0 .0
39.964	.0550					.0318	1.27	3.03	3.19	2.51	.013	.00	.00	PIPE
-5884.918	2751.481	2.993	2754.475	364.00	25.82	10.36	2764.83	.13	5.15	6.00	6.000	.000	.00	0 .0
30.694	.0550					.0280	.86	3.13	2.97	2.51	.013	.00	.00	PIPE
-5854.224	2753.168	3.107	2756.276	364.00	24.62	9.41	2765.69	.12	5.15	6.00	6.000	.000	.00	0 .0
24.267	.0550					.0247	.60	3.23	2.76	2.51	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC3-5.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5829.957	2754.502	3.228	2757.730	364.00	23.48	8.56	2766.29	.11	5.15	5.98	6.000	.000	.00	0 .0
19.644	.0550					.0218	.43	3.34	2.57	2.51	.013	.00	.00	PIPE
-5810.313	2755.582	3.354	2758.936	364.00	22.38	7.78	2766.72	.10	5.15	5.96	6.000	.000	.00	0 .0
16.041	.0550					.0192	.31	3.45	2.39	2.51	.013	.00	.00	PIPE
-5794.272	2756.463	3.488	2759.951	364.00	21.34	7.07	2767.02	.09	5.15	5.92	6.000	.000	.00	0 .0
13.222	.0550					.0170	.22	3.58	2.22	2.51	.013	.00	.00	PIPE
-5781.050	2757.190	3.629	2760.819	364.00	20.35	6.43	2767.25	.08	5.15	5.87	6.000	.000	.00	0 .0
10.886	.0550					.0150	.16	3.71	2.05	2.51	.013	.00	.00	PIPE
-5770.164	2757.789	3.779	2761.568	364.00	19.40	5.85	2767.41	.07	5.15	5.79	6.000	.000	.00	0 .0
8.948	.0550					.0133	.12	3.85	1.90	2.51	.013	.00	.00	PIPE
-5761.216	2758.280	3.938	2762.218	364.00	18.50	5.31	2767.53	.07	5.15	5.70	6.000	.000	.00	0 .0
7.240	.0550					.0119	.09	4.00	1.75	2.51	.013	.00	.00	PIPE
-5753.976	2758.678	4.109	2762.787	364.00	17.64	4.83	2767.62	.06	5.15	5.57	6.000	.000	.00	0 .0
5.770	.0550					.0106	.06	4.17	1.62	2.51	.013	.00	.00	PIPE
-5748.207	2758.995	4.292	2763.287	364.00	16.82	4.39	2767.68	.05	5.15	5.41	6.000	.000	.00	0 .0
4.396	.0550					.0094	.04	4.34	1.48	2.51	.013	.00	.00	PIPE
-5743.810	2759.237	4.491	2763.729	364.00	16.03	3.99	2767.72	.00	5.15	5.21	6.000	.000	.00	0 .0
88.742	.0098					.0086	.76	4.49	1.35	4.32	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC3-S.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5655.068	2760.108	4.642	2764.750	364.00	15.51	3.73	2768.48	.00	5.15	5.02	6.000	.000	.00	0 .0
53.658	.0098					.0079	.42	4.64	1.26	4.32	.013	.00	.00	PIPE
-5601.410	2760.635	4.878	2765.513	364.00	14.78	3.39	2768.91	.00	5.15	4.68	6.000	.000	.00	0 .0
14.190	.0098					.0072	.10	4.88	1.14	4.32	.013	.00	.00	PIPE
-5587.220	2760.774	5.150	2765.924	364.00	14.09	3.08	2769.01	.00	5.15	4.18	6.000	.000	.00	0 .0
JUNCT STR	.0098					.0078	.04	5.28	1.00		.014	.00	.00	PIPE
-5582.220	2760.823	6.201	2767.024	344.00	12.17	2.30	2769.32	.00	5.03	.00	6.000	.000	.00	0 .0
202.800	.0098					.0066	1.34	.00	.00	4.13	.013	.00	.00	PIPE
-5379.420	2762.815	6.031	2768.846	344.00	12.17	2.30	2771.15	.00	5.03	.00	6.000	.000	.00	0 .0
6.556	.0114					.0066	.04	6.03	.00	3.92	.013	.00	.00	PIPE
-5372.864	2762.890	6.000	2768.890	344.00	12.17	2.30	2771.19	.00	5.03	.00	6.000	.000	.00	0 .0
53.905	.0114					.0061	.33	6.00	.00	3.92	.013	.00	.00	PIPE
-5318.959	2763.504	5.555	2769.059	344.00	12.59	2.46	2771.52	.00	5.03	3.14	6.000	.000	.00	0 .0
HYDRAULIC JUMP														
-5318.959	2763.504	4.533	2768.037	344.00	15.01	3.50	2771.54	.00	5.03	5.16	6.000	.000	.00	0 .0
3.125	.0114					.0078	.02	4.53	1.25	3.92	.013	.00	.00	PIPE
-5315.834	2763.540	4.551	2768.091	344.00	14.95	3.47	2771.56	.00	5.03	5.14	6.000	.000	.00	0 .0
22.388	.0114					.0074	.16	4.55	1.24	3.92	.013	.00	.00	PIPE

FILE: MAIN1_FAC3-S.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4
Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 8: 0

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC3-S.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5293.446	2763.795	4.776	2768.571	344.00	14.25	3.15	2771.73	.00	5.03	4.84	6.000	.000	.00	0 .0
6.886	.0114					.0067	.05	4.78	1.12	3.92	.013	.00	.00	PIPE
-5286.560	2763.873	5.031	2768.904	344.00	13.59	2.87	2771.77	.00	5.03	4.42	6.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC4.WSW   RRD
SO  -5582.3902760.799 48                          2767.024
R   -5294.8702762.238 48      .013                              -58.000    .000 1
R   -5198.7702762.718 48      .013                                 .000    .000 0
SH  -5198.7702762.718 48                          2764.678
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q            23.000   .0
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Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 8:20

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC4.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5582.390	2760.799	6.225	2767.024	23.00	1.83	.05	2767.08	.00	1.41	.00	4.000	.000	.00	0 .0
287.520	.0050					.0003	.07	.00	.00	1.29	.013	.00	.00	PIPE
-5294.870	2762.238	4.871	2767.109	23.00	1.83	.05	2767.16	.00	1.41	.00	4.000	.000	.00	0 .0
96.100	.0050					.0003	.02	4.87	.00	1.29	.013	.00	.00	PIPE
-5198.770	2762.718	4.415	2767.133	23.00	1.83	.05	2767.19	.00	1.41	.00	4.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC6.WSW   RRD
SO  -6176.4602735.570 72                          2746.562
R   -6144.3102736.331 72       .013                            60.000    .000 1
R   -5744.3102751.051 72       .013                           -70.000    .000 1
R   -5616.7902752.326 72       .013                              .000    .000 0
SH  -5616.7902752.326 72                          2758.140
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q           191.000    .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC6.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6176.460	2735.570	10.992	2746.562	191.00	6.76	.71	2747.27	.00	3.77	.00	6.000	.000	.00	0 .0
32.150	.0237					.0020	.07	.00	.00	2.23	.013	.00	.00	PIPE
-6144.310	2736.331	10.447	2746.779	191.00	6.76	.71	2747.49	.00	3.77	.00	6.000	.000	.00	0 .0
115.765	.0368					.0020	.24	.00	.00	1.98	.013	.00	.00	PIPE
-6028.545	2740.591	6.494	2747.085	191.00	6.76	.71	2747.79	.00	3.77	.00	6.000	.000	.00	0 .0
HYDRAULIC JUMP														
-6028.545	2740.591	2.060	2742.651	191.00	22.24	7.68	2750.33	.27	3.77	5.70	6.000	.000	.00	0 .0
62.479	.0368					.0305	1.90	2.33	3.19	1.98	.013	.00	.00	PIPE
-5966.065	2742.890	2.102	2744.992	191.00	21.62	7.26	2752.25	.25	3.77	5.72	6.000	.000	.00	0 .0
62.731	.0368					.0275	1.72	2.36	3.07	1.98	.013	.00	.00	PIPE
-5903.334	2745.199	2.177	2747.376	191.00	20.62	6.60	2753.98	.23	3.77	5.77	6.000	.000	.00	0 .0
41.063	.0368					.0241	.99	2.41	2.87	1.98	.013	.00	.00	PIPE
-5862.271	2746.710	2.255	2748.965	191.00	19.66	6.00	2754.96	.21	3.77	5.81	6.000	.000	.00	0 .0
29.630	.0368					.0211	.63	2.47	2.68	1.98	.013	.00	.00	PIPE
-5832.641	2747.800	2.336	2750.136	191.00	18.74	5.45	2755.59	.19	3.77	5.85	6.000	.000	.00	0 .0
22.494	.0368					.0185	.42	2.53	2.50	1.98	.013	.00	.00	PIPE
-5810.147	2748.628	2.421	2751.049	191.00	17.87	4.96	2756.01	.18	3.77	5.89	6.000	.000	.00	0 .0
17.623	.0368					.0163	.29	2.60	2.34	1.98	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC6.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5792.524	2749.277	2.510	2751.787	191.00	17.04	4.51	2756.29	.16	3.77	5.92	6.000	.000	.00	0 .0
14.117	.0368					.0143	.20	2.67	2.18	1.98	.013	.00	.00	PIPE
-5778.407	2749.796	2.602	2752.398	191.00	16.24	4.10	2756.50	.15	3.77	5.95	6.000	.000	.00	0 .0
11.405	.0368					.0126	.14	2.75	2.04	1.98	.013	.00	.00	PIPE
-5767.002	2750.216	2.698	2752.914	191.00	15.49	3.73	2756.64	.14	3.77	5.97	6.000	.000	.00	0 .0
9.224	.0368					.0110	.10	2.83	1.90	1.98	.013	.00	.00	PIPE
-5757.779	2750.555	2.799	2753.354	191.00	14.77	3.39	2756.74	.12	3.77	5.99	6.000	.000	.00	0 .0
7.487	.0368					.0097	.07	2.92	1.77	1.98	.013	.00	.00	PIPE
-5750.292	2750.831	2.904	2753.735	191.00	14.08	3.08	2756.81	.11	3.77	6.00	6.000	.000	.00	0 .0
5.981	.0368					.0085	.05	3.02	1.65	1.98	.013	.00	.00	PIPE
-5744.311	2751.051	3.015	2754.066	191.00	13.43	2.80	2756.86	.00	3.77	6.00	6.000	.000	.00	0 .0
45.678	.0100					.0076	.35	3.01	1.54	2.83	.013	.00	.00	PIPE
-5698.632	2751.508	3.102	2754.610	191.00	12.95	2.60	2757.21	.00	3.77	6.00	6.000	.000	.00	0 .0
36.952	.0100					.0068	.25	3.10	1.46	2.83	.013	.00	.00	PIPE
-5661.681	2751.877	3.222	2755.099	191.00	12.35	2.37	2757.47	.00	3.77	5.98	6.000	.000	.00	0 .0
22.494	.0100					.0060	.14	3.22	1.35	2.83	.013	.00	.00	PIPE
-5639.187	2752.102	3.348	2755.450	191.00	11.77	2.15	2757.60	.00	3.77	5.96	6.000	.000	.00	0 .0
13.408	.0100					.0053	.07	3.35	1.26	2.83	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC6.WSW RRD

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5625.779	2752.236	3.481	2755.717	191.00	11.22	1.96	2757.67	.00	3.77	5.92	6.000	.000	.00	0 .0
6.968	.0100					.0047	.03	3.48	1.17	2.83	.013	.00	.00	PIPE
-5618.811	2752.306	3.622	2755.928	191.00	10.70	1.78	2757.71	.00	3.77	5.87	6.000	.000	.00	0 .0
2.021	.0100					.0042	.01	3.62	1.08	2.83	.013	.00	.00	PIPE
-5616.790	2752.326	3.773	2756.099	191.00	10.20	1.62	2757.71	.00	3.77	5.80	6.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC8A.WSW   SHT
SO   6760.4802731.530 48                          2736.863
R    6836.4802742.000 48       .013                          0.000    .000 0
SH   6836.4802742.000 48                              .000
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q            34.000    .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
6760.480	2731.530	5.333	2736.863	34.00	2.71	.11	2736.98	.00	1.73	.00	4.000	.000	.00	0 .0
9.716	.1378					.0006	.01	5.33	.00	.68	.013	.00	.00	PIPE
6770.196	2732.868	4.000	2736.868	34.00	2.71	.11	2736.98	.00	1.73	.00	4.000	.000	.00	0 .0
2.612	.1378					.0005	.00	4.00	.00	.68	.013	.00	.00	PIPE
6772.808	2733.228	3.629	2736.857	34.00	2.84	.13	2736.98	.00	1.73	2.32	4.000	.000	.00	0 .0
.630	.1378					.0005	.00	3.63	.22	.68	.013	.00	.00	PIPE
6773.438	2733.315	3.539	2736.854	34.00	2.89	.13	2736.98	.00	1.73	2.56	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
6773.438	2733.315	.747	2734.063	34.00	20.95	6.82	2740.88	.00	1.73	3.12	4.000	.000	.00	0 .0
6.132	.1378					.0931	.57	.75	5.12	.68	.013	.00	.00	PIPE
6779.571	2734.160	.759	2734.919	34.00	20.46	6.50	2741.42	.00	1.73	3.14	4.000	.000	.00	0 .0
10.557	.1378					.0843	.89	.76	4.95	.68	.013	.00	.00	PIPE
6790.128	2735.614	.785	2736.399	34.00	19.50	5.91	2742.31	.00	1.73	3.18	4.000	.000	.00	0 .0
7.956	.1378					.0737	.59	.79	4.64	.68	.013	.00	.00	PIPE
6798.083	2736.710	.812	2737.522	34.00	18.60	5.37	2742.89	.00	1.73	3.22	4.000	.000	.00	0 .0
6.283	.1378					.0644	.40	.81	4.35	.68	.013	.00	.00	PIPE
6804.367	2737.575	.839	2738.415	34.00	17.73	4.88	2743.30	.00	1.73	3.26	4.000	.000	.00	0 .0
5.088	.1378					.0562	.29	.84	4.07	.68	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
6809.455	2738.276	.868	2739.145	34.00	16.91	4.44	2743.58	.00	1.73	3.30	4.000	.000	.00	0 .0
4.226	.1378					.0492	.21	.87	3.81	.68	.013	.00	.00	PIPE
6813.681	2738.859	.897	2739.756	34.00	16.12	4.03	2743.79	.00	1.73	3.34	4.000	.000	.00	0 .0
3.542	.1378					.0430	.15	.90	3.57	.68	.013	.00	.00	PIPE
6817.223	2739.347	.928	2740.275	34.00	15.37	3.67	2743.94	.00	1.73	3.38	4.000	.000	.00	0 .0
3.009	.1378					.0376	.11	.93	3.35	.68	.013	.00	.00	PIPE
6820.232	2739.761	.960	2740.721	34.00	14.65	3.33	2744.06	.00	1.73	3.42	4.000	.000	.00	0 .0
2.575	.1378					.0329	.08	.96	3.13	.68	.013	.00	.00	PIPE
6822.807	2740.116	.993	2741.109	34.00	13.97	3.03	2744.14	.00	1.73	3.46	4.000	.000	.00	0 .0
2.216	.1378					.0287	.06	.99	2.93	.68	.013	.00	.00	PIPE
6825.023	2740.421	1.027	2741.448	34.00	13.32	2.76	2744.20	.00	1.73	3.49	4.000	.000	.00	0 .0
1.914	.1378					.0251	.05	1.03	2.75	.68	.013	.00	.00	PIPE
6826.937	2740.685	1.062	2741.747	34.00	12.70	2.51	2744.25	.00	1.73	3.53	4.000	.000	.00	0 .0
1.647	.1378					.0220	.04	1.06	2.57	.68	.013	.00	.00	PIPE
6828.584	2740.912	1.099	2742.011	34.00	12.11	2.28	2744.29	.00	1.73	3.57	4.000	.000	.00	0 .0
1.426	.1378					.0192	.03	1.10	2.41	.68	.013	.00	.00	PIPE
6830.010	2741.108	1.137	2742.246	34.00	11.55	2.07	2744.32	.00	1.73	3.61	4.000	.000	.00	0 .0
1.226	.1378					.0168	.02	1.14	2.25	.68	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
6831.236	2741.277	1.177	2742.454	34.00	11.01	1.88	2744.34	.00	1.73	3.65	4.000	.000	.00	0 .0
1.058	.1378					.0147	.02	1.18	2.11	.68	.013	.00	.00	PIPE
6832.293	2741.423	1.218	2742.641	34.00	10.50	1.71	2744.35	.00	1.73	3.68	4.000	.000	.00	0 .0
.901	.1378					.0129	.01	1.22	1.97	.68	.013	.00	.00	PIPE
6833.195	2741.547	1.261	2742.808	34.00	10.01	1.56	2744.36	.00	1.73	3.72	4.000	.000	.00	0 .0
.770	.1378					.0113	.01	1.26	1.84	.68	.013	.00	.00	PIPE
6833.965	2741.654	1.305	2742.959	34.00	9.54	1.41	2744.37	.00	1.73	3.75	4.000	.000	.00	0 .0
.646	.1378					.0099	.01	1.31	1.73	.68	.013	.00	.00	PIPE
6834.610	2741.742	1.351	2743.094	34.00	9.10	1.29	2744.38	.00	1.73	3.78	4.000	.000	.00	0 .0
.534	.1378					.0087	.00	1.35	1.61	.68	.013	.00	.00	PIPE
6835.144	2741.816	1.399	2743.215	34.00	8.68	1.17	2744.38	.00	1.73	3.82	4.000	.000	.00	0 .0
.432	.1378					.0076	.00	1.40	1.51	.68	.013	.00	.00	PIPE
6835.576	2741.875	1.449	2743.325	34.00	8.27	1.06	2744.39	.00	1.73	3.85	4.000	.000	.00	0 .0
.340	.1378					.0067	.00	1.45	1.41	.68	.013	.00	.00	PIPE
6835.916	2741.922	1.501	2743.424	34.00	7.89	.97	2744.39	.00	1.73	3.87	4.000	.000	.00	0 .0
.256	.1378					.0058	.00	1.50	1.32	.68	.013	.00	.00	PIPE
6836.172	2741.958	1.555	2743.513	34.00	7.52	.88	2744.39	.00	1.73	3.90	4.000	.000	.00	0 .0
.172	.1378					.0051	.00	1.56	1.23	.68	.013	.00	.00	PIPE

‡ FILE: MAIN1_FAC8A.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 4
Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 8:56

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
6836.344	2741.981	1.612	2743.594	34.00	7.17	.80	2744.39	.00	1.73	3.92	4.000	.000	.00	0 .0
.102	.1378					.0045	.00	1.61	1.15	.68	.013	.00	.00	PIPE
6836.446	2741.995	1.671	2743.667	34.00	6.84	.73	2744.39	.00	1.73	3.95	4.000	.000	.00	0 .0
.034	.1378					.0040	.00	1.67	1.07	.68	.013	.00	.00	PIPE
6836.480	2742.000	1.734	2743.733	34.00	6.51	.66	2744.39	.00	1.73	3.96	4.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC8B.WSW   SHT
SO  -6732.4802731.530 48                          2736.863
R   -6656.4802742.000 48      .013                          0.000    .000 1
SH  -6656.4802742.000 48                              .000
CD  18  4               1.500
CD  24  4               2.000
CD  30  4               2.500
CD  36  4               3.000
CD  42  4               3.500
CD  48  4               4.000
CD  54  4               4.500
CD  60  4               5.000
CD  72  4               6.000
Q           60.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8B.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6732.480	2731.530	5.333	2736.863	60.00	4.77	.35	2737.22	.00	2.33	.00	4.000	.000	.00	0 .0
3.274	.1378					.0017	.01	5.33	.00	.91	.013	.00	.00	PIPE
-6729.206	2731.981	4.888	2736.869	60.00	4.77	.35	2737.22	.00	2.33	.00	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
-6729.206	2731.981	1.021	2733.003	60.00	23.70	8.72	2741.73	.00	2.33	3.49	4.000	.000	.00	0 .0
.925	.1378					.0850	.08	1.02	4.90	.91	.013	.00	.00	PIPE
-6728.280	2732.109	1.024	2733.133	60.00	23.60	8.65	2741.78	.00	2.33	3.49	4.000	.000	.00	0 .0
12.813	.1378					.0791	1.01	1.02	4.87	.91	.013	.00	.00	PIPE
-6715.467	2733.874	1.059	2734.933	60.00	22.50	7.86	2742.80	.00	2.33	3.53	4.000	.000	.00	0 .0
9.890	.1378					.0692	.68	1.06	4.56	.91	.013	.00	.00	PIPE
-6705.577	2735.236	1.096	2736.333	60.00	21.46	7.15	2743.48	.00	2.33	3.57	4.000	.000	.00	0 .0
7.927	.1378					.0606	.48	1.10	4.27	.91	.013	.00	.00	PIPE
-6697.650	2736.328	1.134	2737.462	60.00	20.46	6.50	2743.96	.00	2.33	3.61	4.000	.000	.00	0 .0
6.500	.1378					.0530	.34	1.13	4.00	.91	.013	.00	.00	PIPE
-6691.151	2737.224	1.174	2738.398	60.00	19.50	5.91	2744.31	.00	2.33	3.64	4.000	.000	.00	0 .0
5.431	.1378					.0464	.25	1.17	3.74	.91	.013	.00	.00	PIPE
-6685.720	2737.972	1.215	2739.187	60.00	18.60	5.37	2744.56	.00	2.33	3.68	4.000	.000	.00	0 .0
4.594	.1378					.0406	.19	1.22	3.50	.91	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8B.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6681.126	2738.604	1.257	2739.862	60.00	17.73	4.88	2744.74	.00	2.33	3.71	4.000	.000	.00	0 .0
3.913	.1378					.0356	.14	1.26	3.27	.91	.013	.00	.00	PIPE
-6677.213	2739.144	1.301	2740.445	60.00	16.91	4.44	2744.88	.00	2.33	3.75	4.000	.000	.00	0 .0
3.344	.1378					.0312	.10	1.30	3.06	.91	.013	.00	.00	PIPE
-6673.869	2739.604	1.348	2740.952	60.00	16.12	4.03	2744.99	.00	2.33	3.78	4.000	.000	.00	0 .0
2.896	.1378					.0273	.08	1.35	2.86	.91	.013	.00	.00	PIPE
-6670.973	2740.003	1.395	2741.398	60.00	15.37	3.67	2745.07	.00	2.33	3.81	4.000	.000	.00	0 .0
2.490	.1378					.0239	.06	1.40	2.68	.91	.013	.00	.00	PIPE
-6668.483	2740.346	1.445	2741.791	60.00	14.65	3.33	2745.13	.00	2.33	3.84	4.000	.000	.00	0 .0
2.151	.1378					.0210	.05	1.45	2.50	.91	.013	.00	.00	PIPE
-6666.332	2740.643	1.497	2742.140	60.00	13.97	3.03	2745.17	.00	2.33	3.87	4.000	.000	.00	0 .0
1.856	.1378					.0184	.03	1.50	2.34	.91	.013	.00	.00	PIPE
-6664.476	2740.898	1.551	2742.449	60.00	13.32	2.76	2745.21	.00	2.33	3.90	4.000	.000	.00	0 .0
1.600	.1378					.0162	.03	1.55	2.18	.91	.013	.00	.00	PIPE
-6662.876	2741.119	1.607	2742.726	60.00	12.70	2.51	2745.23	.00	2.33	3.92	4.000	.000	.00	0 .0
1.366	.1378					.0142	.02	1.61	2.04	.91	.013	.00	.00	PIPE
-6661.510	2741.307	1.666	2742.973	60.00	12.11	2.28	2745.25	.00	2.33	3.94	4.000	.000	.00	0 .0
1.166	.1378					.0124	.01	1.67	1.90	.91	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC8B.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / *N*	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6660.345	2741.468	1.727	2743.195	60.00	11.55	2.07	2745.27	.00	2.33	3.96	4.000	.000	.00	0 .0
.979	.1378					.0109	.01	1.73	1.78	.91	.013	.00	.00	PIPE
-6659.365	2741.603	1.791	2743.394	60.00	11.01	1.88	2745.28	.00	2.33	3.98	4.000	.000	.00	0 .0
.820	.1378					.0096	.01	1.79	1.66	.91	.013	.00	.00	PIPE
-6658.545	2741.716	1.857	2743.573	60.00	10.50	1.71	2745.28	.00	2.33	3.99	4.000	.000	.00	0 .0
.662	.1378					.0085	.01	1.86	1.55	.91	.013	.00	.00	PIPE
-6657.883	2741.807	1.927	2743.734	60.00	10.01	1.56	2745.29	.00	2.33	4.00	4.000	.000	.00	0 .0
.525	.1378					.0074	.00	1.93	1.44	.91	.013	.00	.00	PIPE
-6657.358	2741.879	2.000	2743.879	60.00	9.54	1.41	2745.29	.00	2.33	4.00	4.000	.000	.00	0 .0
.393	.1378					.0066	.00	2.00	1.34	.91	.013	.00	.00	PIPE
-6656.965	2741.933	2.077	2744.010	60.00	9.10	1.29	2745.30	.00	2.33	4.00	4.000	.000	.00	0 .0
.272	.1378					.0058	.00	2.08	1.25	.91	.013	.00	.00	PIPE
-6656.693	2741.971	2.158	2744.129	60.00	8.68	1.17	2745.30	.00	2.33	3.99	4.000	.000	.00	0 .0
.160	.1378					.0051	.00	2.16	1.16	.91	.013	.00	.00	PIPE
-6656.533	2741.993	2.243	2744.236	60.00	8.27	1.06	2745.30	.00	2.33	3.97	4.000	.000	.00	0 .0
.053	.1378					.0045	.00	2.24	1.08	.91	.013	.00	.00	PIPE
-6656.480	2742.000	2.334	2744.333	60.00	7.88	.96	2745.30	.00	2.33	3.94	4.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC9A.WSW   SHT
SO  -7116.3802720.753 24                          2725.405
R   -7078.2202721.390 24       .013                          60.000    .000 1
R   -6805.9002728.200 24       .013                         -60.000    .000 1
R   -6618.8802747.000 24       .013                           0.000    .000 0
SH  -6618.8802747.000 24                             .000
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q             6.000    .0
```

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC9A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7116.380	2720.753	4.652	2725.405	6.00	1.91	.06	2725.46	.00	.87	.00	2.000	.000	.00	0 .0
38.160	.0167					.0007	.03	.00	.00	.61	.013	.00	.00	PIPE
-7078.220	2721.390	4.054	2725.444	6.00	1.91	.06	2725.50	.00	.87	.00	2.000	.000	.00	0 .0
84.764	.0250					.0007	.06	.00	.00	.55	.013	.00	.00	PIPE
-6993.457	2723.510	2.000	2725.510	6.00	1.91	.06	2725.57	2.00	.87	.00	2.000	.000	.00	0 .0
7.359	.0250					.0007	.00	2.00	.00	.55	.013	.00	.00	PIPE
-6986.097	2723.694	1.814	2725.508	6.00	2.00	.06	2725.57	.00	.87	1.16	2.000	.000	.00	0 .0
4.176	.0250					.0006	.00	1.81	.22	.55	.013	.00	.00	PIPE
-6981.921	2723.798	1.706	2725.504	6.00	2.10	.07	2725.57	.00	.87	1.42	2.000	.000	.00	0 .0
3.337	.0250					.0007	.00	1.71	.26	.55	.013	.00	.00	PIPE
-6978.584	2723.882	1.618	2725.500	6.00	2.20	.08	2725.58	.00	.87	1.57	2.000	.000	.00	0 .0
2.906	.0250					.0008	.00	1.62	.30	.55	.013	.00	.00	PIPE
-6975.679	2723.954	1.540	2725.494	6.00	2.31	.08	2725.58	.00	.87	1.68	2.000	.000	.00	0 .0
2.554	.0250					.0008	.00	1.54	.33	.55	.013	.00	.00	PIPE
-6973.125	2724.018	1.470	2725.489	6.00	2.42	.09	2725.58	.00	.87	1.77	2.000	.000	.00	0 .0
2.280	.0250					.0009	.00	1.47	.36	.55	.013	.00	.00	PIPE
-6970.845	2724.075	1.406	2725.481	6.00	2.54	.10	2725.58	.00	.87	1.83	2.000	.000	.00	0 .0
2.086	.0250					.0011	.00	1.41	.39	.55	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC9A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6968.759	2724.128	1.346	2725.474	6.00	2.57	.11	2725.58	.00	.87	1.88	2.000	.000	.00	0 .0
1.686	.0250					.0012	.00	1.35	.43	.55	.013	.00	.00	PIPE
-6967.073	2724.170	1.291	2725.461	6.00	2.80	.12	2725.58	.00	.87	1.91	2.000	.000	.00	0 .0
HYDRAULIC JUMP														
-6967.073	2724.170	.554	2724.724	6.00	8.46	1.11	2725.83	.02	.87	1.79	2.000	.000	.00	0 .0
15.837	.0250					.0250	.40	.57	2.37	.55	.013	.00	.00	PIPE
-6951.236	2724.566	.554	2725.120	6.00	8.46	1.11	2726.23	.02	.87	1.79	2.000	.000	.00	0 .0
50.984	.0250					.0256	1.31	.57	2.37	.55	.013	.00	.00	PIPE
-6900.251	2725.841	.547	2726.388	6.00	8.60	1.15	2727.54	.02	.87	1.78	2.000	.000	.00	0 .0
31.144	.0250					.0281	.88	.56	2.42	.55	.013	.00	.00	PIPE
-6869.107	2726.619	.529	2727.148	6.00	9.02	1.26	2728.41	.02	.87	1.76	2.000	.000	.00	0 .0
15.202	.0250					.0321	.49	.55	2.59	.55	.013	.00	.00	PIPE
-6853.905	2727.000	.511	2727.510	6.00	9.46	1.39	2728.90	.02	.87	1.74	2.000	.000	.00	0 .0
10.409	.0250					.0367	.38	.53	2.77	.55	.013	.00	.00	PIPE
-6843.497	2727.260	.494	2727.754	6.00	9.93	1.53	2729.28	.02	.87	1.73	2.000	.000	.00	0 .0
8.010	.0250					.0420	.34	.51	2.96	.55	.013	.00	.00	PIPE
-6835.487	2727.460	.477	2727.937	6.00	10.41	1.68	2729.62	.02	.87	1.70	2.000	.000	.00	0 .0
6.659	.0250					.0480	.32	.50	3.16	.55	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC9A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6828.828	2727.626	.462	2728.089	6.00	10.92	1.85	2729.94	.02	.87	1.69	2.000	.000	.00	0 .0
5.652	.0250					.0549	.31	.49	3.37	.55	.013	.00	.00	PIPE
-6823.176	2727.768	.446	2728.214	6.00	11.45	2.04	2730.25	.03	.87	1.67	2.000	.000	.00	0 .0
5.012	.0250					.0628	.31	.47	3.60	.55	.013	.00	.00	PIPE
-6818.164	2727.893	.432	2728.325	6.00	12.01	2.24	2730.57	.03	.87	1.65	2.000	.000	.00	0 .0
4.458	.0250					.0719	.32	.46	3.84	.55	.013	.00	.00	PIPE
-6813.705	2728.005	.417	2728.422	6.00	12.60	2.46	2730.89	.03	.87	1.63	2.000	.000	.00	0 .0
4.077	.0250					.0823	.34	.45	4.10	.55	.013	.00	.00	PIPE
-6809.628	2728.107	.404	2728.511	6.00	13.21	2.71	2731.22	.03	.87	1.61	2.000	.000	.00	0 .0
3.728	.0250					.0942	.35	.44	4.38	.55	.013	.00	.00	PIPE
-6805.899	2728.200	.391	2728.592	6.00	13.86	2.98	2731.57	.00	.87	1.59	2.000	.000	.00	0 .0
67.802	.1005					.1006	6.82	.39	4.67	.39	.013	.00	.00	PIPE
-6738.097	2735.016	.391	2735.407	6.00	13.86	2.98	2738.39	.00	.87	1.59	2.000	.000	.00	0 .0
41.953	.1005					.0999	4.19	.39	4.67	.39	.013	.00	.00	PIPE
-6696.145	2739.233	.392	2739.625	6.00	13.80	2.96	2742.58	.00	.87	1.59	2.000	.000	.00	0 .0
33.984	.1005					.0930	3.16	.39	4.65	.39	.013	.00	.00	PIPE
-6662.160	2742.650	.405	2743.055	6.00	13.15	2.69	2745.74	.00	.87	1.61	2.000	.000	.00	0 .0
11.954	.1005					.0813	.97	.41	4.35	.39	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC9A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6650.207	2743.851	.419	2744.271	6.00	12.54	2.44	2746.71	.00	.87	1.63	2.000	.000	.00	0 .0
7.052	.1005					.0710	.50	.42	4.08	.39	.013	.00	.00	PIPE
-6643.155	2744.560	.433	2744.993	6.00	11.96	2.22	2747.21	.00	.87	1.65	2.000	.000	.00	0 .0
4.859	.1005					.0621	.30	.43	3.82	.39	.013	.00	.00	PIPE
-6638.295	2745.049	.448	2745.497	6.00	11.40	2.02	2747.52	.00	.87	1.67	2.000	.000	.00	0 .0
3.643	.1005					.0543	.20	.45	3.58	.39	.013	.00	.00	PIPE
-6634.653	2745.415	.463	2745.878	6.00	10.87	1.84	2747.71	.00	.87	1.69	2.000	.000	.00	0 .0
2.841	.1005					.0474	.13	.46	3.35	.39	.013	.00	.00	PIPE
-6631.812	2745.700	.479	2746.179	6.00	10.36	1.67	2747.85	.00	.87	1.71	2.000	.000	.00	0 .0
2.297	.1005					.0415	.10	.48	3.14	.39	.013	.00	.00	PIPE
-6629.515	2745.931	.495	2746.427	6.00	9.88	1.52	2747.94	.00	.87	1.73	2.000	.000	.00	0 .0
1.880	.1005					.0363	.07	.50	2.94	.39	.013	.00	.00	PIPE
-6627.635	2746.120	.512	2746.633	6.00	9.42	1.38	2748.01	.00	.87	1.75	2.000	.000	.00	0 .0
1.560	.1005					.0317	.05	.51	2.75	.39	.013	.00	.00	PIPE
-6626.075	2746.277	.530	2746.807	6.00	8.98	1.25	2748.06	.00	.87	1.77	2.000	.000	.00	0 .0
1.305	.1005					.0278	.04	.53	2.57	.39	.013	.00	.00	PIPE
-6624.770	2746.408	.549	2746.957	6.00	8.57	1.14	2748.10	.00	.87	1.79	2.000	.000	.00	0 .0
1.110	.1005					.0243	.03	.55	2.41	.39	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC9A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6623.660	2746.520	.568	2747.088	6.00	8.17	1.04	2748.12	.00	.87	1.80	2.000	.000	.00	0 .0
.948	.1005					.0213	.02	.57	2.26	.39	.013	.00	.00	PIPE
-6622.712	2746.615	.587	2747.202	6.00	7.79	.94	2748.14	.00	.87	1.82	2.000	.000	.00	0 .0
.789	.1005					.0186	.01	.59	2.11	.39	.013	.00	.00	PIPE
-6621.923	2746.694	.608	2747.302	6.00	7.42	.86	2748.16	.00	.87	1.84	2.000	.000	.00	0 .0
.675	.1005					.0163	.01	.61	1.97	.39	.013	.00	.00	PIPE
-6621.249	2746.762	.629	2747.391	6.00	7.08	.78	2748.17	.00	.87	1.86	2.000	.000	.00	0 .0
.565	.1005					.0143	.01	.63	1.85	.39	.013	.00	.00	PIPE
-6620.684	2746.819	.651	2747.470	6.00	6.75	.71	2748.18	.00	.87	1.87	2.000	.000	.00	0 .0
.469	.1005					.0125	.01	.65	1.73	.39	.013	.00	.00	PIPE
-6620.214	2746.866	.674	2747.540	6.00	6.44	.64	2748.18	.00	.87	1.89	2.000	.000	.00	0 .0
.385	.1005					.0109	.00	.67	1.62	.39	.013	.00	.00	PIPE
-6619.830	2746.905	.698	2747.603	6.00	6.14	.58	2748.19	.00	.87	1.91	2.000	.000	.00	0 .0
.310	.1005					.0096	.00	.70	1.51	.39	.013	.00	.00	PIPE
-6619.520	2746.936	.723	2747.659	6.00	5.85	.53	2748.19	.00	.87	1.92	2.000	.000	.00	0 .0
.242	.1005					.0084	.00	.72	1.41	.39	.013	.00	.00	PIPE
-6619.278	2746.960	.749	2747.709	6.00	5.58	.48	2748.19	.00	.87	1.94	2.000	.000	.00	0 .0
.182	.1005					.0074	.00	.75	1.32	.39	.013	.00	.00	PIPE

Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING

Date: 3- 3-2016 Time:10: 9:29

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC9A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6619.096	2746.979	.776	2747.755	6.00	5.32	.44	2748.19	.00	.87	1.95	2.000	.000	.00	0 .0
.127	.1005					.0065	.00	.78	1.23	.39	.013	.00	.00	PIPE
-6618.969	2746.991	.804	2747.795	6.00	5.07	.40	2748.19	.00	.87	1.96	2.000	.000	.00	0 .0
.066	.1005					.0057	.00	.80	1.15	.39	.013	.00	.00	PIPE
-6618.903	2746.998	.834	2747.832	6.00	4.84	.36	2748.20	.00	.87	1.97	2.000	.000	.00	0 .0
.023	.1005					.0050	.00	.83	1.07	.39	.013	.00	.00	PIPE
-6618.880	2747.000	.866	2747.866	6.00	4.60	.33	2748.20	.00	.87	1.98	2.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC10A.WSW
SO   7790.9102687.180 48                          2692.147
R    7806.9102689.220 48      .013                            4.000    .000 1
R    7827.3302695.000 48      .013                             .000    .000
SH   7827.3302695.000 48                             .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q           23.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10A.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
7790.910	2687.180	4.967	2692.147	23.00	1.83	.05	2692.20	.00	1.41	.00	4.000	.000	.00	0 .0
7.622	.1275					.0003	.00	.00	.00	.58	.013	.00	.00	PIPE
7798.532	2688.152	4.000	2692.152	23.00	1.83	.05	2692.20	4.00	1.41	.00	4.000	.000	.00	0 .0
2.866	.1275					.0002	.00	4.00	.00	.58	.013	.00	.00	PIPE
7801.397	2688.517	3.629	2692.146	23.00	1.92	.06	2692.20	.00	1.41	2.32	4.000	.000	.00	0 .0
1.652	.1275					.0002	.00	3.63	.15	.58	.013	.00	.00	PIPE
7803.050	2688.728	3.413	2692.141	23.00	2.01	.06	2692.20	.00	1.41	2.83	4.000	.000	.00	0 .0
1.341	.1275					.0003	.00	3.41	.18	.58	.013	.00	.00	PIPE
7804.391	2688.899	3.236	2692.135	23.00	2.11	.07	2692.20	.00	1.41	3.14	4.000	.000	.00	0 .0
1.172	.1275					.0003	.00	3.24	.20	.58	.013	.00	.00	PIPE
7805.563	2689.048	3.080	2692.128	23.00	2.21	.08	2692.20	.00	1.41	3.37	4.000	.000	.00	0 .0
1.041	.1275					.0003	.00	3.08	.22	.58	.013	.00	.00	PIPE
7806.604	2689.181	2.940	2692.121	23.00	2.32	.08	2692.21	.00	1.41	3.53	4.000	.000	.00	0 .0
.305	.1275					.0003	.00	2.94	.24	.58	.013	.00	.00	PIPE
7806.909	2689.220	2.899	2692.119	23.00	2.36	.09	2692.20	.00	1.41	3.57	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
7806.910	2689.219	.598	2689.817	23.00	19.56	5.94	2695.76	.00	1.41	2.85	4.000	.000	.00	0 .0
1.546	.2831					.1062	.16	.60	5.37	.48	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10A.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
7808.456	2689.657	.608	2690.265	23.00	19.07	5.65	2695.91	.00	1.41	2.87	4.000	.000	.00	0 .0
2.635	.2831					.0959	.25	.61	5.19	.48	.013	.00	.00	PIPE
7811.091	2690.403	.628	2691.031	23.00	18.18	5.13	2696.16	.00	1.41	2.91	4.000	.000	.00	0 .0
2.235	.2831					.0837	.19	.63	4.86	.48	.013	.00	.00	PIPE
7813.326	2691.036	.649	2691.685	23.00	17.33	4.67	2696.35	.00	1.41	2.95	4.000	.000	.00	0 .0
1.915	.2831					.0731	.14	.65	4.55	.48	.013	.00	.00	PIPE
7815.241	2691.578	.671	2692.249	23.00	16.53	4.24	2696.49	.00	1.41	2.99	4.000	.000	.00	0 .0
1.654	.2831					.0638	.11	.67	4.27	.48	.013	.00	.00	PIPE
7816.895	2692.046	.694	2692.740	23.00	15.76	3.86	2696.60	.00	1.41	3.03	4.000	.000	.00	0 .0
1.441	.2831					.0558	.08	.69	4.00	.48	.013	.00	.00	PIPE
7818.335	2692.454	.717	2693.171	23.00	15.02	3.51	2696.68	.00	1.41	3.07	4.000	.000	.00	0 .0
1.257	.2831					.0487	.06	.72	3.75	.48	.013	.00	.00	PIPE
7819.593	2692.810	.741	2693.551	23.00	14.33	3.19	2696.74	.00	1.41	3.11	4.000	.000	.00	0 .0
1.101	.2831					.0425	.05	.74	3.51	.48	.013	.00	.00	PIPE
7820.693	2693.121	.766	2693.887	23.00	13.66	2.90	2696.78	.00	1.41	3.15	4.000	.000	.00	0 .0
.965	.2831					.0372	.04	.77	3.29	.48	.013	.00	.00	PIPE
7821.659	2693.395	.792	2694.187	23.00	13.02	2.63	2696.82	.00	1.41	3.19	4.000	.000	.00	0 .0
.848	.2831					.0325	.03	.79	3.08	.48	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10A.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
7822.506	2693.635	.819	2694.454	23.00	12.42	2.39	2696.85	.00	1.41	3.23	4.000	.000	.00	0 .0
.745	.2831					.0284	.02	.82	2.89	.48	.013	.00	.00	PIPE
7823.251	2693.845	.847	2694.692	23.00	11.84	2.18	2696.87	.00	1.41	3.27	4.000	.000	.00	0 .0
.654	.2831					.0248	.02	.85	2.71	.48	.013	.00	.00	PIPE
7823.905	2694.030	.876	2694.906	23.00	11.29	1.98	2696.89	.00	1.41	3.31	4.000	.000	.00	0 .0
.573	.2831					.0217	.01	.88	2.53	.48	.013	.00	.00	PIPE
7824.478	2694.193	.906	2695.099	23.00	10.76	1.80	2696.90	.00	1.41	3.35	4.000	.000	.00	0 .0
.502	.2831					.0190	.01	.91	2.37	.48	.013	.00	.00	PIPE
7824.980	2694.335	.937	2695.272	23.00	10.26	1.64	2696.91	.00	1.41	3.39	4.000	.000	.00	0 .0
.438	.2831					.0166	.01	.94	2.22	.48	.013	.00	.00	PIPE
7825.418	2694.459	.969	2695.428	23.00	9.78	1.49	2696.91	.00	1.41	3.43	4.000	.000	.00	0 .0
.380	.2831					.0145	.01	.97	2.08	.48	.013	.00	.00	PIPE
7825.798	2694.566	1.002	2695.569	23.00	9.33	1.35	2696.92	.00	1.41	3.47	4.000	.000	.00	0 .0
.325	.2831					.0127	.00	1.00	1.95	.48	.013	.00	.00	PIPE
7826.123	2694.658	1.037	2695.696	23.00	8.90	1.23	2696.92	.00	1.41	3.51	4.000	.000	.00	0 .0
.282	.2831					.0111	.00	1.04	1.83	.48	.013	.00	.00	PIPE
7826.405	2694.738	1.072	2695.810	23.00	8.48	1.12	2696.93	.00	1.41	3.54	4.000	.000	.00	0 .0
.236	.2831					.0097	.00	1.07	1.71	.48	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10A.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
7826.642	2694.805	1.109	2695.914	23.00	8.09	1.02	2696.93	.00	1.41	3.58	4.000	.000	.00	0 .0
.194	.2831					.0085	.00	1.11	1.60	.48	.013	.00	.00	PIPE
7826.836	2694.860	1.148	2696.008	23.00	7.71	.92	2696.93	.00	1.41	3.62	4.000	.000	.00	0 .0
.159	.2831					.0074	.00	1.15	1.50	.48	.013	.00	.00	PIPE
7826.995	2694.905	1.188	2696.093	23.00	7.35	.84	2696.93	.00	1.41	3.66	4.000	.000	.00	0 .0
.124	.2831					.0065	.00	1.19	1.40	.48	.013	.00	.00	PIPE
7827.119	2694.940	1.230	2696.170	23.00	7.01	.76	2696.93	.00	1.41	3.69	4.000	.000	.00	0 .0
.095	.2831					.0057	.00	1.23	1.31	.48	.013	.00	.00	PIPE
7827.214	2694.967	1.273	2696.240	23.00	6.68	.69	2696.93	.00	1.41	3.73	4.000	.000	.00	0 .0
.065	.2831					.0050	.00	1.27	1.23	.48	.013	.00	.00	PIPE
7827.279	2694.986	1.318	2696.304	23.00	6.37	.63	2696.93	.00	1.41	3.76	4.000	.000	.00	0 .0
.041	.2831					.0044	.00	1.32	1.15	.48	.013	.00	.00	PIPE
7827.320	2694.997	1.364	2696.361	23.00	6.08	.57	2696.93	.00	1.41	3.79	4.000	.000	.00	0 .0
.010	.2831					.0038	.00	1.36	1.07	.48	.013	.00	.00	PIPE
7827.330	2695.000	1.414	2696.414	23.00	5.79	.52	2696.93	.00	1.41	3.82	4.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC10B.WSW
SO  -7762.9102686.410 48                          2692.147
R   -7746.9102687.580 48      .013                            28.340    .000 1
R   -7707.3402694.000 48      .013                              .000    .000
SH  -7707.3402694.000 48                             .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q           36.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10B.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7762.910	2686.410	5.737	2692.147	36.00	2.86	.13	2692.27	.00	1.79	.00	4.000	.000	.00	0 .0
16.000	.0731					.0006	.01	.00	.00	.82	.013	.00	.00	PIPE
-7746.910	2687.580	4.598	2692.178	36.00	2.86	.13	2692.31	.00	1.79	.00	4.000	.000	.00	0 .0
3.698	.1622					.0006	.00	4.60	.00	.68	.013	.00	.00	PIPE
-7743.212	2688.180	4.000	2692.180	36.00	2.86	.13	2692.31	.00	1.79	.00	4.000	.000	.00	0 .0
2.209	.1622					.0006	.00	4.00	.00	.68	.013	.00	.00	PIPE
-7741.003	2688.538	3.629	2692.167	36.00	3.00	.14	2692.31	.00	1.79	2.32	4.000	.000	.00	0 .0
1.025	.1622					.0006	.00	3.63	.23	.68	.013	.00	.00	PIPE
-7739.978	2688.705	3.452	2692.157	36.00	3.12	.15	2692.31	.00	1.79	2.75	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
-7739.978	2688.705	.829	2689.533	36.00	19.12	5.68	2695.21	.00	1.79	3.24	4.000	.000	.00	0 .0
.856	.1622					.0699	.06	.83	4.42	.68	.013	.00	.00	PIPE
-7739.121	2688.844	.834	2689.677	36.00	18.93	5.57	2695.24	.00	1.79	3.25	4.000	.000	.00	0 .0
4.885	.1622					.0646	.32	.83	4.36	.68	.013	.00	.00	PIPE
-7734.236	2689.636	.863	2690.499	36.00	18.05	5.06	2695.56	.00	1.79	3.29	4.000	.000	.00	0 .0
4.075	.1622					.0565	.23	.86	4.09	.68	.013	.00	.00	PIPE
-7730.161	2690.297	.892	2691.189	36.00	17.21	4.60	2695.79	.00	1.79	3.33	4.000	.000	.00	0 .0
3.430	.1622					.0494	.17	.89	3.83	.68	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10B.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7726.731	2690.854	.923	2691.777	36.00	16.41	4.18	2695.96	.00	1.79	3.37	4.000	.000	.00	0 .0
2.932	.1622					.0432	.13	.92	3.59	.68	.013	.00	.00	PIPE
-7723.799	2691.329	.954	2692.283	36.00	15.65	3.80	2696.09	.00	1.79	3.41	4.000	.000	.00	0 .0
2.511	.1622					.0377	.09	.95	3.36	.68	.013	.00	.00	PIPE
-7721.288	2691.737	.987	2692.724	36.00	14.92	3.46	2696.18	.00	1.79	3.45	4.000	.000	.00	0 .0
2.168	.1622					.0330	.07	.99	3.14	.68	.013	.00	.00	PIPE
-7719.120	2692.089	1.021	2693.110	36.00	14.23	3.14	2696.25	.00	1.79	3.49	4.000	.000	.00	0 .0
1.879	.1622					.0289	.05	1.02	2.94	.68	.013	.00	.00	PIPE
-7717.241	2692.394	1.056	2693.450	36.00	13.56	2.86	2696.31	.00	1.79	3.53	4.000	.000	.00	0 .0
1.625	.1622					.0252	.04	1.06	2.76	.68	.013	.00	.00	PIPE
-7715.615	2692.657	1.093	2693.750	36.00	12.93	2.60	2696.35	.00	1.79	3.57	4.000	.000	.00	0 .0
1.420	.1622					.0221	.03	1.09	2.58	.68	.013	.00	.00	PIPE
-7714.195	2692.888	1.130	2694.018	36.00	12.33	2.36	2696.38	.00	1.79	3.60	4.000	.000	.00	0 .0
1.222	.1622					.0193	.02	1.13	2.41	.68	.013	.00	.00	PIPE
-7712.973	2693.086	1.170	2694.256	36.00	11.76	2.15	2696.40	.00	1.79	3.64	4.000	.000	.00	0 .0
1.061	.1622					.0169	.02	1.17	2.26	.68	.013	.00	.00	PIPE
-7711.913	2693.258	1.211	2694.469	36.00	11.21	1.95	2696.42	.00	1.79	3.68	4.000	.000	.00	0 .0
.918	.1622					.0148	.01	1.21	2.11	.68	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10B.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7710.995	2693.407	1.253	2694.660	36.00	10.69	1.77	2696.43	.00	1.79	3.71	4.000	.000	.00	0 .0
.786	.1622					.0130	.01	1.25	1.98	.68	.013	.00	.00	PIPE
-7710.209	2693.534	1.297	2694.832	36.00	10.19	1.61	2696.44	.00	1.79	3.74	4.000	.000	.00	0 .0
.667	.1622					.0114	.01	1.30	1.85	.68	.013	.00	.00	PIPE
-7709.542	2693.643	1.343	2694.986	36.00	9.72	1.47	2696.45	.00	1.79	3.78	4.000	.000	.00	0 .0
.560	.1622					.0100	.01	1.34	1.73	.68	.013	.00	.00	PIPE
-7708.982	2693.733	1.391	2695.125	36.00	9.26	1.33	2696.46	.00	1.79	3.81	4.000	.000	.00	0 .0
.470	.1622					.0087	.00	1.39	1.62	.68	.013	.00	.00	PIPE
-7708.513	2693.810	1.440	2695.250	36.00	8.83	1.21	2696.46	.00	1.79	3.84	4.000	.000	.00	0 .0
.376	.1622					.0077	.00	1.44	1.51	.68	.013	.00	.00	PIPE
-7708.137	2693.871	1.492	2695.363	36.00	8.42	1.10	2696.46	.00	1.79	3.87	4.000	.000	.00	0 .0
.296	.1622					.0067	.00	1.49	1.41	.68	.013	.00	.00	PIPE
-7707.840	2693.919	1.546	2695.465	36.00	8.03	1.00	2696.47	.00	1.79	3.90	4.000	.000	.00	0 .0
.224	.1622					.0059	.00	1.55	1.32	.68	.013	.00	.00	PIPE
-7707.616	2693.955	1.602	2695.557	36.00	7.66	.91	2696.47	.00	1.79	3.92	4.000	.000	.00	0 .0
.158	.1622					.0052	.00	1.60	1.23	.68	.013	.00	.00	PIPE
-7707.458	2693.981	1.660	2695.641	36.00	7.30	.83	2696.47	.00	1.79	3.94	4.000	.000	.00	0 .0
.090	.1622					.0045	.00	1.66	1.15	.68	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC10B.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7707.368	2693.995	1.721	2695.717	36.00	6.96	.75	2696.47	.00	1.79	3.96	4.000	.000	.00	0 .0
.028	.1622					.0040	.00	1.72	1.07	.68	.013	.00	.00	PIPE
-7707.340	2694.000	1.786	2695.786	36.00	6.63	.68	2696.47	.00	1.79	3.98	4.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC12A.WSW   SHT
SO   8723.6402677.000 24                          2685.475
R    8739.6402678.080 24      .013                          0.000    .000 0
SH   8739.6402678.080 24                             .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q            22.000   .0
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Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING

Date: 3- 3-2016 Time:10:11:40

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC12A.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
8723.640	2677.000	8.475	2685.475	22.00	7.00	.76	2686.24	.00	1.68	.00	2.000	.000	.00	0 .0
16.000	.0675					.0095	.15	8.48	.00	.85	.013	.00	.00	PIPE
8739.640	2678.080	7.546	2685.626	22.00	7.00	.76	2686.39	.00	1.68	.00	2.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC12B.WSW   SHT
SO  -8695.6402677.000 24                          2685.475
R   -8679.6402678.080 24      .013                              0.000    .000 0
SH  -8679.6402678.080 24                             .000
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q            22.000    .0
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¶ FILE: MAIN1_FAC12B.WSW                W S P G W - CIVILDESIGN Version 14.08                    PAGE   1
                          Program Package Serial Number: 7044
                                   WATER SURFACE PROFILE LISTING                    Date: 3- 3-2016  Time:10:14:41
                      THE SEVENTY
                          GCW INC. PROJECT# 840.050
                            FILENAME: MAIN1_FAC12B.WSW    SHT
*****************************************************************************************************************************
 Station   | Invert  | Depth   | Water   |   Q     |  Vel    |  Vel    | Energy  | Super   |Critical |Flow Top |Height/  |Base Wt  |         |No Wth   |
           | Elev    | (FT)    | Elev    | (CFS)   | (FPS)   | Head    | Grd.El. | Elev    | Depth   | Width   |Dia.-FT  |or I.D.  |   ZL    |Prs/Pip  |
           |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
 L/Elem    |Ch Slope |         |         |         |         |SF Ave   |   HF    |SE Dpth  |Froude N |Norm Dp  |   "N"   |X-Fall   |   ZR    |Type Ch  |
*********  |*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******|
-8695.640  | 2677.000|   8.475 | 2685.475|   22.00 |   7.00  |    .76  | 2686.24 |    .00  |   1.68  |    .00  |  2.000  |    .000 |    .00  |   0     |   .0    |
           |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
   16.000  |   .0675 |         |         |         |         |  .0095  |    .15  |   8.48  |    .00  |    .85  |   .013  |    .00  |    .00  |PIPE     |
           |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
-8679.640  | 2678.080|   7.546 | 2685.626|   22.00 |   7.00  |    .76  | 2686.39 |    .00  |   1.68  |    .00  |  2.000  |    .000 |    .00  |   0     |   .0    |
           |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC13A.WSW
SO  -9166.0602668.400 36                          2675.655
R   -9136.0602672.900 36       .013                          14.000    .000 1
R   -9121.9202675.020 36       .013                            .000    .000
SH  -9121.9202675.020 36                             .000
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q            22.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC13A.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-9166.060	2668.400	7.255	2675.655	22.00	3.11	.15	2675.81	.00	1.51	.00	3.000	.000	.00	0 .0
28.701	.1500					.0011	.03	.00	.00	.59	.013	.00	.00	PIPE
-9137.358	2672.705	3.000	2675.705	22.00	3.11	.15	2675.86	3.00	1.51	.00	3.000	.000	.00	0 .0
1.299	.1500					.0010	.00	3.00	.00	.59	.013	.00	.00	PIPE
-9136.060	2672.900	2.796	2675.696	22.00	3.21	.16	2675.86	.00	1.51	1.51	3.000	.000	.00	0 .0
1.103	.1499					.0010	.00	2.80	.27	.59	.013	.00	.00	PIPE
-9134.957	2673.065	2.616	2675.681	22.00	3.36	.18	2675.86	.00	1.51	2.00	3.000	.000	.00	0 .0
.437	.1499					.0010	.00	2.62	.33	.59	.013	.00	.00	PIPE
-9134.521	2673.131	2.542	2675.673	22.00	3.44	.18	2675.86	.00	1.51	2.16	3.000	.000	.00	0 .0
HYDRAULIC JUMP														
-9134.521	2673.131	.837	2673.968	22.00	13.65	2.89	2676.86	.00	1.51	2.69	3.000	.000	.00	0 .0
1.113	.1499					.0362	.04	.84	3.11	.59	.013	.00	.00	PIPE
-9133.407	2673.298	.854	2674.152	22.00	13.26	2.73	2676.88	.00	1.51	2.71	3.000	.000	.00	0 .0
1.858	.1499					.0325	.06	.85	2.99	.59	.013	.00	.00	PIPE
-9131.549	2673.576	.884	2674.460	22.00	12.64	2.48	2676.94	.00	1.51	2.74	3.000	.000	.00	0 .0
1.603	.1499					.0285	.05	.88	2.79	.59	.013	.00	.00	PIPE
-9129.946	2673.817	.915	2674.732	22.00	12.05	2.26	2676.99	.00	1.51	2.76	3.000	.000	.00	0 .0
1.385	.1499					.0249	.03	.92	2.61	.59	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC13A.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-9128.562	2674.024	.947	2674.971	22.00	11.49	2.05	2677.02	.00	1.51	2.79	3.000	.000	.00	0 .0
1.198	.1499					.0218	.03	.95	2.44	.59	.013	.00	.00	PIPE
-9127.363	2674.204	.980	2675.184	22.00	10.96	1.86	2677.05	.00	1.51	2.81	3.000	.000	.00	0 .0
1.028	.1499					.0191	.02	.98	2.29	.59	.013	.00	.00	PIPE
-9126.335	2674.358	1.015	2675.374	22.00	10.45	1.70	2677.07	.00	1.51	2.84	3.000	.000	.00	0 .0
.887	.1499					.0168	.01	1.02	2.14	.59	.013	.00	.00	PIPE
-9125.448	2674.491	1.051	2675.542	22.00	9.96	1.54	2677.08	.00	1.51	2.86	3.000	.000	.00	0 .0
.763	.1499					.0147	.01	1.05	2.00	.59	.013	.00	.00	PIPE
-9124.686	2674.606	1.088	2675.694	22.00	9.50	1.40	2677.09	.00	1.51	2.88	3.000	.000	.00	0 .0
.645	.1499					.0129	.01	1.09	1.87	.59	.013	.00	.00	PIPE
-9124.041	2674.702	1.127	2675.830	22.00	9.06	1.27	2677.10	.00	1.51	2.91	3.000	.000	.00	0 .0
.539	.1499					.0113	.01	1.13	1.75	.59	.013	.00	.00	PIPE
-9123.502	2674.783	1.168	2675.951	22.00	8.64	1.16	2677.11	.00	1.51	2.93	3.000	.000	.00	0 .0
.452	.1499					.0099	.00	1.17	1.63	.59	.013	.00	.00	PIPE
-9123.050	2674.851	1.210	2676.061	22.00	8.23	1.05	2677.11	.00	1.51	2.94	3.000	.000	.00	0 .0
.366	.1499					.0087	.00	1.21	1.52	.59	.013	.00	.00	PIPE
-9122.684	2674.906	1.254	2676.160	22.00	7.85	.96	2677.12	.00	1.51	2.96	3.000	.000	.00	0 .0
.281	.1499					.0076	.00	1.25	1.42	.59	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC13A.WSW

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-9122.402	2674.948	1.301	2676.249	22.00	7.48	.87	2677.12	.00	1.51	2.97	3.000	.000	.00	0 .0
.217	.1499					.0067	.00	1.30	1.33	.59	.013	.00	.00	PIPE
-9122.186	2674.980	1.349	2676.330	22.00	7.14	.79	2677.12	.00	1.51	2.98	3.000	.000	.00	0 .0
.152	.1499					.0059	.00	1.35	1.24	.59	.013	.00	.00	PIPE
-9122.033	2675.003	1.399	2676.402	22.00	6.80	.72	2677.12	.00	1.51	2.99	3.000	.000	.00	0 .0
.085	.1499					.0052	.00	1.40	1.15	.59	.013	.00	.00	PIPE
-9121.948	2675.016	1.452	2676.468	22.00	6.49	.65	2677.12	.00	1.51	3.00	3.000	.000	.00	0 .0
.028	.1499					.0046	.00	1.45	1.08	.59	.013	.00	.00	PIPE
-9121.920	2675.020	1.508	2676.528	22.00	6.18	.59	2677.12	.00	1.51	3.00	3.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC13B.WSW
SO   9187.8102668.400 36                          2675.655
R    9208.6502669.840 36      .013                          24.240    .000 1
R    9238.3302671.880 36      .013                            .000    .000
SH   9238.3302671.880 36                             .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q           22.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC13B.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
9187.810	2668.400	7.255	2675.655	22.00	3.11	.15	2675.81	.00	1.51	.00	3.000	.000	.00	0 .0
20.841	.0691					.0011	.02	.00	.00	.72	.013	.00	.00	PIPE
9208.650	2669.840	5.861	2675.701	22.00	3.11	.15	2675.85	.00	1.51	.00	3.000	.000	.00	0 .0
29.680	.0687					.0011	.03	5.86	.00	.72	.013	.00	.00	PIPE
9238.330	2671.880	3.853	2675.733	22.00	3.11	.15	2675.88	.00	1.51	.00	3.000	.000	.00	0 .0

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WSPGW ANALYSIS

MAIN 2

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN2-RCB2.WSW   SHT
SO  -7519.0102698.462 15                          2703.115
R   -7413.7302706.021 15      .015                                   89.000
R   -7319.4202712.792 15      .015                                     .000
R   -7198.3502721.485 15      .015                                  -62.000
R   -7059.4702724.374 15      .015                                     .000
R   -6981.7202725.991 15      .015                                     .000
R   -6923.1002727.210 15      .015                                   30.000
R   -6798.3502729.805 15      .015                                     .000
R   -6749.9902730.821 15      .015                                     .000
R   -6739.8902731.030 15      .015                                   30.000
R   -6609.8402733.736 15      .015                                     .000
R   -6526.9502734.565 15      .015                                  -42.000
JX  -6230.9102740.485 15 48   .015   23.000          2740.485         30.0
R   -6143.4902748.869 15      .015                                     .000
R   -6094.8102753.537 15      .015                                  -45.000
TS  -6083.2402754.647 18      .015                                     .000
R   -6052.2502757.619 18      .015                                   25.000
R   -6034.0202759.370 18      .015                                   41.800
SH  -6034.0202759.370 18                            .000
CD  10  3   1   1.000  12.000   25.000  .000  .000  .00
CD  11  3   0    .000   9.000   17.000  .000  .000  .00
CD  12  3   0    .000  12.000   25.000  .000  .000  .00
CD  13  3   0    .000  12.000   15.000  .000  .000  .00
CD  14  3   0    .000   9.000   12.000  .000  .000  .00
CD  15  3   0    .000   8.000   10.000  .000  .000  .00
CD  16  4   0    .000   6.000     .000  .000  .000  .00
CD  17  4   0    .000   4.000     .000  .000  .000  .00
CD  18  3   0    .000   9.000   20.000  .000  .000  .00
CD  19  3   0    .000   9.000   20.000  .000  .000  .00
CD  48  4   0    .000   4.000     .000  .000  .000  .00
Q          1910.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2-RCB2.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7519.010	2698.462	4.749	2703.210	1933.00	40.71	25.73	2728.94	8.00	8.00	10.00	8.000	10.000	.00	0 .0
21.536	.0718					.0509	1.10	8.00	3.29	4.20	.015	.00	.00	BOX
-7497.474	2700.008	4.795	2704.803	1933.00	40.31	25.24	2730.04	8.00	8.00	10.00	8.000	10.000	.00	0 .0
83.744	.0718					.0472	3.95	8.00	3.24	4.20	.015	.00	.00	BOX
-7413.730	2706.021	5.029	2711.050	1933.00	38.44	22.94	2733.99	.00	8.00	10.00	8.000	10.000	.00	0 .0
43.842	.0718					.0424	1.86	5.03	3.02	4.20	.015	.00	.00	BOX
-7369.888	2709.169	5.196	2714.365	1933.00	37.20	21.49	2735.85	.00	8.00	10.00	8.000	10.000	.00	0 .0
50.468	.0718					.0381	1.92	5.20	2.88	4.20	.015	.00	.00	BOX
-7319.420	2712.792	5.450	2718.242	1933.00	35.47	19.53	2737.78	8.00	8.00	10.00	8.000	10.000	.00	0 .0
6.813	.0718					.0354	.24	8.00	2.68	4.20	.015	.00	.00	BOX
-7312.607	2713.281	5.491	2718.772	1933.00	35.21	19.25	2738.02	8.00	8.00	10.00	8.000	10.000	.00	0 .0
38.146	.0718					.0330	1.26	8.00	2.65	4.20	.015	.00	.00	BOX
-7274.460	2716.020	5.759	2721.779	1933.00	33.57	17.50	2739.28	8.00	8.00	10.00	8.000	10.000	.00	0 .0
30.661	.0718					.0291	.89	8.00	2.47	4.20	.015	.00	.00	BOX
-7243.800	2718.222	6.040	2724.261	1933.00	32.01	15.91	2740.17	8.00	8.00	10.00	8.000	10.000	.00	0 .0
24.969	.0718					.0257	.64	8.00	2.30	4.20	.015	.00	.00	BOX
-7218.831	2720.014	6.334	2726.349	1933.00	30.52	14.46	2740.81	8.00	8.00	10.00	8.000	10.000	.00	0 .0
20.481	.0718					.0227	.47	8.00	2.14	4.20	.015	.00	.00	BOX

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2-RCB2.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7198.350	2721.485	6.644	2728.129	1933.00	29.10	13.15	2741.27	.00	8.00	10.00	8.000	10.000	.00	0 .0
138.880	.0208					.0214	2.98	6.64	1.99	6.71	.015	.00	.00	BOX
-7059.470	2724.374	6.614	2730.988	1933.00	29.23	13.27	2744.25	.00	8.00	10.00	8.000	10.000	.00	0 .0
77.750	.0208					.0217	1.68	6.61	2.00	6.71	.015	.00	.00	BOX
-6981.720	2725.991	6.591	2732.582	1933.00	29.33	13.36	2745.94	8.00	8.00	10.00	8.000	10.000	.00	0 .0
58.620	.0208					.0218	1.28	8.00	2.01	6.71	.015	.00	.00	BOX
-6923.100	2727.210	6.571	2733.781	1933.00	29.42	13.44	2747.22	.00	8.00	10.00	8.000	10.000	.00	0 .0
124.750	.0208					.0222	2.77	6.57	2.02	6.71	.015	.00	.00	BOX
-6798.350	2729.805	6.517	2736.322	1933.00	29.66	13.66	2749.98	.00	8.00	10.00	8.000	10.000	.00	0 .0
48.360	.0210					.0225	1.09	6.52	2.05	6.68	.015	.00	.00	BOX
-6749.990	2730.821	6.494	2737.315	1933.00	29.77	13.76	2751.07	8.00	8.00	10.00	8.000	10.000	.00	0 .0
10.100	.0207					.0226	.23	8.00	2.06	6.72	.015	.00	.00	BOX
-6739.890	2731.030	6.488	2737.518	1933.00	29.79	13.78	2751.30	.00	8.00	10.00	8.000	10.000	.00	0 .0
130.050	.0208					.0231	3.00	6.49	2.06	6.71	.015	.00	.00	BOX
-6609.840	2733.736	6.400	2740.136	1933.00	30.20	14.17	2754.30	1.25	8.00	10.00	8.000	10.000	.00	0 .0
9.033	.0100					.0236	.21	7.65	2.10	8.00	.015	.00	.00	BOX
-6600.807	2733.826	6.364	2740.190	1933.00	30.37	14.33	2754.52	1.27	8.00	10.00	8.000	10.000	.00	0 .0
73.857	.0100					.0254	1.87	7.63	2.12	8.00	.015	.00	.00	BOX

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2-RCB2.WSW SHT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
-6526.950	2734.565	6.068	2740.633	1933.00	31.86	15.76	2756.39	.00	8.00	10.00	8.000	10.000	.00	0	.0
JUNCT STR	.0200					.0333	9.85	6.07	2.28		.015	.00	.00	BOX	
-6230.910	2740.485	5.194	2745.679	1910.00	36.77	21.00	2766.67	.00	8.00	10.00	8.000	10.000	.00	0	.0
.523	.0959					.0396	.02	5.19	2.84	3.75	.015	.00	.00	BOX	
-6230.387	2740.535	5.198	2745.734	1910.00	36.74	20.96	2766.70	.00	8.00	10.00	8.000	10.000	.00	0	.0
28.127	.0959					.0372	1.05	5.20	2.84	3.75	.015	.00	.00	BOX	
-6202.259	2743.233	5.452	2748.685	1910.00	35.03	19.06	2767.74	.00	8.00	10.00	8.000	10.000	.00	0	.0
23.230	.0959					.0328	.76	5.45	2.64	3.75	.015	.00	.00	BOX	
-6179.029	2745.461	5.718	2751.179	1910.00	33.40	17.32	2768.50	.00	8.00	10.00	8.000	10.000	.00	0	.0
19.349	.0959					.0289	.56	5.72	2.46	3.75	.015	.00	.00	BOX	
-6159.681	2747.316	5.997	2753.313	1910.00	31.85	15.75	2769.06	.00	8.00	10.00	8.000	10.000	.00	0	.0
16.190	.0959					.0255	.41	6.00	2.29	3.75	.015	.00	.00	BOX	
-6143.490	2748.869	6.290	2755.159	1910.00	30.37	14.32	2769.48	8.00	8.00	10.00	8.000	10.000	.00	0	.0
.647	.0959					.0239	.02	8.00	2.13	3.75	.015	.00	.00	BOX	
-6142.842	2748.931	6.303	2755.234	1910.00	30.30	14.26	2769.49	8.00	8.00	10.00	8.000	10.000	.00	0	.0
13.462	.0959					.0225	.30	8.00	2.13	3.75	.015	.00	.00	BOX	
-6129.380	2750.222	6.611	2756.833	1910.00	28.89	12.96	2769.79	8.00	8.00	10.00	8.000	10.000	.00	0	.0
11.255	.0959					.0199	.22	8.00	1.98	3.75	.015	.00	.00	BOX	

Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING

Date: 3- 2-2016 Time: 6:22:33

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2-RCB2.WSW SHT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
-6118.125	2751.301	6.933	2758.235	1910.00	27.55	11.78	2770.02	8.00	8.00	10.00	8.000	10.000	.00	0	.0
9.358	.0959					.0176	.16	8.00	1.84	3.75	.015	.00	.00	BOX	
-6108.767	2752.199	7.272	2759.470	1910.00	26.27	10.71	2770.18	8.00	8.00	10.00	8.000	10.000	.00	0	.0
7.706	.0959					.0156	.12	8.00	1.72	3.75	.015	.00	.00	BOX	
---------- WARNING - Flow depth near top of box conduit ----------															
-6101.061	2752.938	7.627	2760.564	1910.00	25.04	9.74	2770.30	8.00	8.00	10.00	8.000	10.000	.00	0	.0
6.250	.0959					.0173	.11	8.00	1.60	3.75	.015	.00	.00	BOX	
---------- WARNING - Flow depth near top of box conduit ----------															
-6094.810	2753.537	8.000	2761.537	1910.00	23.88	8.85	2770.39	.00	8.00	10.00	8.000	10.000	.00	0	.0
TRANS STR	.0959					.0025	.03	8.00	1.49		.015	.00	.00	BOX	
-6083.240	2754.647	15.899	2770.546	1910.00	10.61	1.75	2772.29	.00	6.57	20.00	9.000	20.000	.00	0	.0
30.990	.0959					.0025	.08	.00	.62	2.14	.015	.00	.00	BOX	
-6052.250	2757.619	13.190	2770.809	1910.00	10.61	1.75	2772.56	.00	6.57	20.00	9.000	20.000	.00	0	.0
18.230	.0961					.0025	.05	.00	.62	2.13	.015	.00	.00	BOX	
-6034.020	2759.370	11.723	2771.094	1910.00	10.61	1.75	2772.84	.00	6.57	20.00	9.000	20.000	.00	0	.0

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WSPGW ANALYSIS

MAINLINE 2 LATERALS

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T1 THE TWO FIFTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN-RCP6.WSW   SHT
SO  -6230.9302741.000 48                    2748.635
R   -6157.6002742.480 48      .013                    -48.500    .000 1
R   -5802.5302764.240 48      .013                      0.000    .000 0
SH  -5802.5302764.240 48                      .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q          54.000   .0
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THE TWO FIFTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN-RCP6.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6230.930	2741.000	7.635	2748.635	54.00	4.30	.29	2748.92	.00	2.21	.00	4.000	.000	.00	0 .0
73.330	.0202					.0014	.10	.00	.00	1.40	.013	.00	.00	PIPE
-6157.600	2742.480	6.315	2748.795	54.00	4.30	.29	2749.08	.00	2.21	.00	4.000	.000	.00	0 .0
34.604	.0613					.0014	.05	6.32	.00	1.05	.013	.00	.00	PIPE
-6122.996	2744.601	4.243	2748.844	54.00	4.30	.29	2749.13	.00	2.21	.00	4.000	.000	.00	0 .0
HYDRAULIC JUMP														
-6122.996	2744.601	1.054	2745.654	54.00	20.43	6.48	2752.13	.00	2.21	3.52	4.000	.000	.00	0 .0
5.583	.0613					.0613	.34	1.05	4.16	1.05	.013	.00	.00	PIPE
-6117.414	2744.943	1.054	2745.996	54.00	20.43	6.48	2752.47	.00	2.21	3.52	4.000	.000	.00	0 .0
143.660	.0613					.0583	8.38	1.05	4.16	1.05	.013	.00	.00	PIPE
-5973.753	2753.747	1.081	2754.828	54.00	19.69	6.02	2760.85	.00	2.21	3.55	4.000	.000	.00	0 .0
54.188	.0613					.0519	2.81	1.08	3.95	1.05	.013	.00	.00	PIPE
-5919.565	2757.068	1.118	2758.186	54.00	18.78	5.48	2763.66	.00	2.21	3.59	4.000	.000	.00	0 .0
28.844	.0613					.0454	1.31	1.12	3.70	1.05	.013	.00	.00	PIPE
-5890.721	2758.835	1.157	2759.992	54.00	17.90	4.98	2764.97	.00	2.21	3.63	4.000	.000	.00	0 .0
19.126	.0613					.0397	.76	1.16	3.46	1.05	.013	.00	.00	PIPE
-5871.595	2760.007	1.197	2761.204	54.00	17.07	4.53	2765.73	.00	2.21	3.66	4.000	.000	.00	0 .0
13.930	.0613					.0348	.48	1.20	3.24	1.05	.013	.00	.00	PIPE

THE TWO FIFTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN-RCP6.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5857.665	2760.861	1.239	2762.100	54.00	16.28	4.11	2766.21	.00	2.21	3.70	4.000	.000	.00	0 .0
10.701	.0613					.0304	.33	1.24	3.03	1.05	.013	.00	.00	PIPE
-5846.964	2761.517	1.283	2762.800	54.00	15.52	3.74	2766.54	.00	2.21	3.73	4.000	.000	.00	0 .0
8.522	.0613					.0267	.23	1.28	2.83	1.05	.013	.00	.00	PIPE
-5838.441	2762.039	1.328	2763.367	54.00	14.80	3.40	2766.77	.00	2.21	3.77	4.000	.000	.00	0 .0
6.911	.0613					.0234	.16	1.33	2.65	1.05	.013	.00	.00	PIPE
-5831.530	2762.463	1.375	2763.838	54.00	14.11	3.09	2766.93	.00	2.21	3.80	4.000	.000	.00	0 .0
5.685	.0613					.0205	.12	1.38	2.48	1.05	.013	.00	.00	PIPE
-5825.846	2762.811	1.424	2764.235	54.00	13.45	2.81	2767.04	.00	2.21	3.83	4.000	.000	.00	0 .0
4.718	.0613					.0180	.08	1.42	2.32	1.05	.013	.00	.00	PIPE
-5821.128	2763.100	1.475	2764.575	54.00	12.83	2.55	2767.13	.00	2.21	3.86	4.000	.000	.00	0 .0
3.935	.0613					.0157	.06	1.48	2.16	1.05	.013	.00	.00	PIPE
-5817.193	2763.341	1.528	2764.869	54.00	12.23	2.32	2767.19	.00	2.21	3.89	4.000	.000	.00	0 .0
3.267	.0613					.0138	.05	1.53	2.02	1.05	.013	.00	.00	PIPE
-5813.926	2763.542	1.584	2765.125	54.00	11.66	2.11	2767.24	.00	2.21	3.91	4.000	.000	.00	0 .0
2.744	.0613					.0121	.03	1.58	1.89	1.05	.013	.00	.00	PIPE
-5811.182	2763.710	1.641	2765.351	54.00	11.12	1.92	2767.27	.00	2.21	3.94	4.000	.000	.00	0 .0
2.260	.0613					.0106	.02	1.64	1.76	1.05	.013	.00	.00	PIPE

THE TWO FIFTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN-RCP6.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5808.921	2763.848	1.701	2765.549	54.00	10.60	1.74	2767.29	.00	2.21	3.96	4.000	.000	.00	0 .0
1.841	.0613					.0093	.02	1.70	1.65	1.05	.013	.00	.00	PIPE
-5807.081	2763.961	1.764	2765.725	54.00	10.11	1.59	2767.31	.00	2.21	3.97	4.000	.000	.00	0 .0
1.492	.0613					.0082	.01	1.76	1.54	1.05	.013	.00	.00	PIPE
-5805.588	2764.052	1.829	2765.882	54.00	9.64	1.44	2767.32	.00	2.21	3.99	4.000	.000	.00	0 .0
1.148	.0613					.0072	.01	1.83	1.43	1.05	.013	.00	.00	PIPE
-5804.440	2764.123	1.898	2766.021	54.00	9.19	1.31	2767.33	.00	2.21	3.99	4.000	.000	.00	0 .0
.858	.0613					.0064	.01	1.90	1.33	1.05	.013	.00	.00	PIPE
-5803.582	2764.176	1.970	2766.146	54.00	8.76	1.19	2767.34	.00	2.21	4.00	4.000	.000	.00	0 .0
.599	.0613					.0056	.00	1.97	1.24	1.05	.013	.00	.00	PIPE
-5802.983	2764.212	2.045	2766.257	54.00	8.35	1.08	2767.34	.00	2.21	4.00	4.000	.000	.00	0 .0
.346	.0613					.0049	.00	2.05	1.16	1.05	.013	.00	.00	PIPE
-5802.637	2764.233	2.124	2766.357	54.00	7.96	.98	2767.34	.00	2.21	3.99	4.000	.000	.00	0 .0
.107	.0613					.0043	.00	2.12	1.08	1.05	.013	.00	.00	PIPE
-5802.530	2764.240	2.209	2766.448	54.00	7.59	.89	2767.34	.00	2.21	3.98	4.000	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN2_FAC16C.WSW   SHT
SO  -6220.9102741.560 48                          2745.679
R   -6157.5802745.110 48      .013                              -48.500    .000 1
R   -5802.5102764.240 48      .013                                0.000    .000 0
SH  -5802.5102764.240 48                              .000
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q          54.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC16C.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6220.910	2741.560	1.082	2742.642	54.00	19.67	6.01	2748.65	.57	2.21	3.55	4.000	.000	.00	0 .0
63.330	.0561					.0545	3.45	1.65	3.95	1.08	.013	.00	.00	PIPE
-6157.581	2745.110	1.089	2746.198	54.00	19.51	5.91	2752.11	.00	2.21	3.56	4.000	.000	.00	0 .0
37.031	.0539					.0539	2.00	1.09	3.90	1.09	.013	.00	.00	PIPE
-6120.550	2747.105	1.089	2748.194	54.00	19.51	5.91	2754.10	.00	2.21	3.56	4.000	.000	.00	0 .0
147.574	.0539					.0511	7.55	1.09	3.90	1.09	.013	.00	.00	PIPE
-5972.976	2755.056	1.118	2756.174	54.00	18.78	5.48	2761.65	.00	2.21	3.59	4.000	.000	.00	0 .0
53.987	.0539					.0454	2.45	1.12	3.70	1.09	.013	.00	.00	PIPE
-5918.988	2757.964	1.157	2759.121	54.00	17.90	4.98	2764.10	.00	2.21	3.63	4.000	.000	.00	0 .0
29.132	.0539					.0397	1.16	1.16	3.46	1.09	.013	.00	.00	PIPE
-5889.856	2759.534	1.197	2760.731	54.00	17.07	4.53	2765.26	.00	2.21	3.66	4.000	.000	.00	0 .0
19.329	.0539					.0348	.67	1.20	3.24	1.09	.013	.00	.00	PIPE
-5870.527	2760.575	1.239	2761.814	54.00	16.28	4.11	2765.93	.00	2.21	3.70	4.000	.000	.00	0 .0
14.085	.0539					.0304	.43	1.24	3.03	1.09	.013	.00	.00	PIPE
-5856.442	2761.334	1.283	2762.617	54.00	15.52	3.74	2766.36	.00	2.21	3.73	4.000	.000	.00	0 .0
10.843	.0539					.0267	.29	1.28	2.83	1.09	.013	.00	.00	PIPE
-5845.599	2761.918	1.328	2763.247	54.00	14.80	3.40	2766.65	.00	2.21	3.77	4.000	.000	.00	0 .0
8.589	.0539					.0234	.20	1.33	2.65	1.09	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC16C.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5837.010	2762.381	1.375	2763.756	54.00	14.11	3.09	2766.85	.00	2.21	3.80	4.000	.000	.00	0 .0
6.945	.0539					.0205	.14	1.38	2.48	1.09	.013	.00	.00	PIPE
-5830.064	2762.755	1.424	2764.179	54.00	13.45	2.81	2766.99	.00	2.21	3.83	4.000	.000	.00	0 .0
5.690	.0539					.0180	.10	1.42	2.32	1.09	.013	.00	.00	PIPE
-5824.374	2763.062	1.475	2764.537	54.00	12.83	2.55	2767.09	.00	2.21	3.86	4.000	.000	.00	0 .0
4.699	.0539					.0157	.07	1.48	2.16	1.09	.013	.00	.00	PIPE
-5819.675	2763.315	1.528	2764.843	54.00	12.23	2.32	2767.17	.00	2.21	3.89	4.000	.000	.00	0 .0
3.871	.0539					.0138	.05	1.53	2.02	1.09	.013	.00	.00	PIPE
-5815.804	2763.524	1.584	2765.108	54.00	11.66	2.11	2767.22	.00	2.21	3.91	4.000	.000	.00	0 .0
3.231	.0539					.0121	.04	1.58	1.89	1.09	.013	.00	.00	PIPE
-5812.573	2763.698	1.641	2765.339	54.00	11.12	1.92	2767.26	.00	2.21	3.94	4.000	.000	.00	0 .0
2.647	.0539					.0106	.03	1.64	1.76	1.09	.013	.00	.00	PIPE
-5809.925	2763.840	1.701	2765.542	54.00	10.60	1.74	2767.29	.00	2.21	3.96	4.000	.000	.00	0 .0
2.147	.0539					.0093	.02	1.70	1.65	1.09	.013	.00	.00	PIPE
-5807.778	2763.956	1.764	2765.720	54.00	10.11	1.59	2767.31	.00	2.21	3.97	4.000	.000	.00	0 .0
1.734	.0539					.0082	.01	1.76	1.54	1.09	.013	.00	.00	PIPE
-5806.044	2764.050	1.829	2765.879	54.00	9.64	1.44	2767.32	.00	2.21	3.99	4.000	.000	.00	0 .0
1.331	.0539					.0072	.01	1.83	1.43	1.09	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC16C.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5804.714	2764.121	1.898	2766.020	54.00	9.19	1.31	2767.33	.00	2.21	3.99	4.000	.000	.00	0 .0
.992	.0539					.0064	.01	1.90	1.33	1.09	.013	.00	.00	PIPE

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-5803.722  2764.175   1.970  2766.145   54.00   8.76   1.19  2767.34   .00   2.21   4.00   4.000   .000  .00   0   .0
   -|-        -|-      -|-      -|-      -|-     -|-    -|-     -|-    -|-    -|-    -|-     -|-    -|-    -|-  |-
  .690      .0539                                       .0056     .00   1.97   1.24   1.09    .013    .00   .00  PIPE
-5803.031  2764.212   2.045  2766.257   54.00   8.35   1.08  2767.34   .00   2.21   4.00   4.000   .000  .00   0   .0
   -|-        -|-      -|-      -|-      -|-     -|-    -|-     -|-    -|-    -|-    -|-     -|-    -|-    -|-  |-
  .398      .0539                                       .0049     .00   2.05   1.16   1.09    .013    .00   .00  PIPE
-5802.633  2764.233   2.124  2766.357   54.00   7.96    .98  2767.34   .00   2.21   3.99   4.000   .000  .00   0   .0
   -|-        -|-      -|-      -|-      -|-     -|-    -|-     -|-    -|-    -|-    -|-     -|-    -|-    -|-  |-
  .124      .0539                                       .0043     .00   2.12   1.08   1.09    .013    .00   .00  PIPE
-5802.510  2764.240   2.209  2766.448   54.00   7.59    .89  2767.34   .00   2.21   3.98   4.000   .000  .00   0   .0
   -|-        -|-      -|-      -|-      -|-     -|-    -|-     -|-    -|-    -|-    -|-     -|-    -|-    -|-  |-
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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1_FAC17.WSW
SO  -6739.9902733.420 42                          2737.518
R   -6682.9002744.240 42       .013                          .000     .000
SH  -6682.9002744.240 42                             .000
CD  18  4                1.500
CD  24  4                2.000
CD  30  4                2.500
CD  36  4                3.000
CD  42  4                3.500
CD  48  4                4.000
CD  54  4                4.500
CD  60  4                5.000
CD  72  4                6.000
Q            51.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC17.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6739.990	2733.420	.930	2734.350	51.00	24.89	9.62	2743.97	.00	2.23	3.09	3.500	.000	.00	0 .0
1.454	.1895					.1067	.16	.93	5.39	.81	.013	.00	.00	PIPE
-6738.536	2733.696	.934	2734.630	51.00	24.72	9.49	2744.12	.00	2.23	3.10	3.500	.000	.00	0 .0
9.182	.1895					.0990	.91	.93	5.34	.81	.013	.00	.00	PIPE
-6729.354	2735.436	.966	2736.402	51.00	23.57	8.63	2745.03	.00	2.23	3.13	3.500	.000	.00	0 .0
7.295	.1895					.0867	.63	.97	5.00	.81	.013	.00	.00	PIPE
-6722.059	2736.818	1.000	2737.818	51.00	22.48	7.84	2745.66	.00	2.23	3.16	3.500	.000	.00	0 .0
5.966	.1895					.0759	.45	1.00	4.68	.81	.013	.00	.00	PIPE
-6716.093	2737.949	1.035	2738.984	51.00	21.43	7.13	2746.12	.00	2.23	3.19	3.500	.000	.00	0 .0
4.973	.1895					.0664	.33	1.04	4.38	.81	.013	.00	.00	PIPE
-6711.120	2738.892	1.071	2739.963	51.00	20.43	6.48	2746.45	.00	2.23	3.23	3.500	.000	.00	0 .0
4.204	.1895					.0581	.24	1.07	4.09	.81	.013	.00	.00	PIPE
-6706.917	2739.688	1.108	2740.796	51.00	19.48	5.89	2746.69	.00	2.23	3.26	3.500	.000	.00	0 .0
3.583	.1895					.0509	.18	1.11	3.83	.81	.013	.00	.00	PIPE
-6703.333	2740.367	1.147	2741.515	51.00	18.58	5.36	2746.87	.00	2.23	3.29	3.500	.000	.00	0 .0
3.078	.1895					.0446	.14	1.15	3.58	.81	.013	.00	.00	PIPE
-6700.255	2740.951	1.188	2742.139	51.00	17.71	4.87	2747.01	.00	2.23	3.31	3.500	.000	.00	0 .0
2.664	.1895					.0391	.10	1.19	3.35	.81	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC17.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6697.591	2741.456	1.230	2742.686	51.00	16.89	4.43	2747.11	.00	2.23	3.34	3.500	.000	.00	0 .0
2.309	.1895					.0343	.08	1.23	3.13	.81	.013	.00	.00	PIPE
-6695.282	2741.893	1.274	2743.167	51.00	16.10	4.03	2747.19	.00	2.23	3.37	3.500	.000	.00	0 .0
2.006	.1895					.0300	.06	1.27	2.93	.81	.013	.00	.00	PIPE
-6693.276	2742.273	1.320	2743.594	51.00	15.35	3.66	2747.25	.00	2.23	3.39	3.500	.000	.00	0 .0
1.745	.1895					.0264	.05	1.32	2.73	.81	.013	.00	.00	PIPE
-6691.532	2742.604	1.368	2743.972	51.00	14.64	3.33	2747.30	.00	2.23	3.42	3.500	.000	.00	0 .0
1.523	.1895					.0231	.04	1.37	2.55	.81	.013	.00	.00	PIPE
-6690.009	2742.893	1.417	2744.310	51.00	13.96	3.02	2747.33	.00	2.23	3.44	3.500	.000	.00	0 .0
1.317	.1895					.0203	.03	1.42	2.38	.81	.013	.00	.00	PIPE
-6688.691	2743.142	1.469	2744.611	51.00	13.31	2.75	2747.36	.00	2.23	3.45	3.500	.000	.00	0 .0
1.141	.1895					.0178	.02	1.47	2.23	.81	.013	.00	.00	PIPE
-6687.550	2743.359	1.523	2744.882	51.00	12.69	2.50	2747.38	.00	2.23	3.47	3.500	.000	.00	0 .0
.985	.1895					.0157	.02	1.52	2.08	.81	.013	.00	.00	PIPE
-6686.565	2743.545	1.579	2745.124	51.00	12.10	2.27	2747.40	.00	2.23	3.48	3.500	.000	.00	0 .0
.839	.1895					.0138	.01	1.58	1.94	.81	.013	.00	.00	PIPE
-6685.726	2743.704	1.638	2745.343	51.00	11.53	2.07	2747.41	.00	2.23	3.49	3.500	.000	.00	0 .0
.709	.1895					.0121	.01	1.64	1.81	.81	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1_FAC17.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-6685.017	2743.839	1.700	2745.539	51.00	11.00	1.88	2747.42	.00	2.23	3.50	3.500	.000	.00	0 .0
.591	.1895					.0107	.01	1.70	1.68	.81	.013	.00	.00	PIPE

-6684.426	2743.951	1.765	2745.716	51.00	10.49	1.71	2747.42	.00	2.23	3.50	3.500	.000	.00	0	.0
.484	.1895					.0094	.00	1.77	1.57	.81	.013	.00	.00	PIPE	
-6683.942	2744.042	1.833	2745.875	51.00	10.00	1.55	2747.43	.00	2.23	3.50	3.500	.000	.00	0	.0
.387	.1895					.0083	.00	1.83	1.46	.81	.013	.00	.00	PIPE	
-6683.556	2744.116	1.904	2746.020	51.00	9.53	1.41	2747.43	.00	2.23	3.49	3.500	.000	.00	0	.0
.292	.1895					.0073	.00	1.90	1.36	.81	.013	.00	.00	PIPE	
-6683.263	2744.171	1.979	2746.150	51.00	9.09	1.28	2747.43	.00	2.23	3.47	3.500	.000	.00	0	.0
.206	.1895					.0064	.00	1.98	1.26	.81	.013	.00	.00	PIPE	
-6683.058	2744.210	2.058	2746.268	51.00	8.67	1.17	2747.43	.00	2.23	3.45	3.500	.000	.00	0	.0
.120	.1895					.0057	.00	2.06	1.17	.81	.013	.00	.00	PIPE	
-6682.938	2744.233	2.142	2746.375	51.00	8.26	1.06	2747.43	.00	2.23	3.41	3.500	.000	.00	0	.0
.038	.1895					.0050	.00	2.14	1.08	.81	.013	.00	.00	PIPE	
-6682.900	2744.240	2.232	2746.472	51.00	7.87	.96	2747.44	.00	2.23	3.36	3.500	.000	.00	0	.0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN2_FAC19.WSW   SHT
SO  -7049.3802726.520 18                          2731.195
R   -7032.6802728.880 18      .013                                60.000    .000 1
R   -7003.6802736.320 18      .013                                30.000    .000 0
SH  -7003.6802736.320 18                              .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q            2.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC19.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7049.380	2726.520	4.675	2731.195	2.00	1.13	.02	2731.21	.00	.53	.00	1.500	.000	.00	0 .0
16.700	.1413					.0004	.01	.00	.00	.23	.013	.00	.00	PIPE
-7032.680	2728.880	2.325	2731.205	2.00	1.13	.02	2731.23	.00	.53	.00	1.500	.000	.00	0 .0
3.225	.2566					.0004	.00	.00	.00	.20	.013	.00	.00	PIPE
-7029.455	2729.707	1.500	2731.207	2.00	1.13	.02	2731.23	1.50	.53	.00	1.500	.000	.00	0 .0
.534	.2566					.0003	.00	1.50	.00	.20	.013	.00	.00	PIPE
-7028.921	2729.844	1.360	2731.205	2.00	1.19	.02	2731.23	.00	.53	.87	1.500	.000	.00	0 .0
.304	.2566					.0003	.00	1.36	.15	.20	.013	.00	.00	PIPE
-7028.617	2729.922	1.280	2731.202	2.00	1.24	.02	2731.23	.00	.53	1.06	1.500	.000	.00	0 .0
.252	.2566					.0004	.00	1.28	.18	.20	.013	.00	.00	PIPE
-7028.365	2729.987	1.213	2731.200	2.00	1.31	.03	2731.23	.00	.53	1.18	1.500	.000	.00	0 .0
.121	.2566					.0004	.00	1.21	.20	.20	.013	.00	.00	PIPE
-7028.245	2730.018	1.155	2731.173	2.00	1.37	.03	2731.20	.00	.53	1.26	1.500	.000	.00	0 .0
HYDRAULIC JUMP														
-7028.245	2730.018	.200	2730.218	2.00	14.27	3.16	2733.38	.12	.53	1.02	1.500	.000	.00	0 .0
6.129	.2566					.2316	1.42	.32	6.78	.20	.013	.00	.00	PIPE
-7022.115	2731.591	.207	2731.798	2.00	13.53	2.84	2734.64	.11	.53	1.03	1.500	.000	.00	0 .0
4.458	.2566					.2002	.89	.31	6.31	.20	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC19.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7017.657	2732.734	.214	2732.948	2.00	12.90	2.58	2735.53	.10	.53	1.05	1.500	.000	.00	0 .0
2.785	.2566					.1748	.49	.31	5.91	.20	.013	.00	.00	PIPE
-7014.872	2733.449	.221	2733.670	2.00	12.30	2.35	2736.02	.09	.53	1.06	1.500	.000	.00	0 .0
1.978	.2566					.1527	.30	.31	5.54	.20	.013	.00	.00	PIPE
-7012.895	2733.956	.229	2734.185	2.00	11.72	2.13	2736.32	.08	.53	1.08	1.500	.000	.00	0 .0
1.518	.2566					.1333	.20	.31	5.20	.20	.013	.00	.00	PIPE
-7011.377	2734.346	.236	2734.582	2.00	11.18	1.94	2736.52	.08	.53	1.09	1.500	.000	.00	0 .0
1.201	.2566					.1163	.14	.31	4.87	.20	.013	.00	.00	PIPE
-7010.176	2734.654	.244	2734.898	2.00	10.66	1.76	2736.66	.07	.53	1.11	1.500	.000	.00	0 .0
.983	.2566					.1016	.10	.31	4.56	.20	.013	.00	.00	PIPE
-7009.193	2734.906	.252	2735.158	2.00	10.16	1.60	2736.76	.06	.53	1.12	1.500	.000	.00	0 .0
.815	.2566					.0887	.07	.32	4.28	.20	.013	.00	.00	PIPE
-7008.378	2735.115	.261	2735.376	2.00	9.69	1.46	2736.83	.06	.53	1.14	1.500	.000	.00	0 .0
.690	.2566					.0776	.05	.32	4.01	.20	.013	.00	.00	PIPE
-7007.688	2735.292	.270	2735.562	2.00	9.24	1.33	2736.89	.06	.53	1.15	1.500	.000	.00	0 .0
.590	.2566					.0678	.04	.33	3.76	.20	.013	.00	.00	PIPE
-7007.098	2735.444	.279	2735.723	2.00	8.81	1.20	2736.93	.05	.53	1.17	1.500	.000	.00	0 .0
.509	.2566					.0592	.03	.33	3.52	.20	.013	.00	.00	PIPE

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC19.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7006.589	2735.574	.288	2735.862	2.00	8.40	1.10	2736.96	.05	.53	1.18	1.500	.000	.00	0 .0
.437	.2566					.0517	.02	.33	3.30	.20	.013	.00	.00	PIPE

-7006.152	2735.686	.298	2735.984	2.00	8.01	1.00	2736.98	.04	.53	1.20	1.500	.000	.00	0	.0	
.381	.2566					.0452	.02	.34	3.09	.20	.013	.00	.00	PIPE		
-7005.771	2735.784	.308	2736.092	2.00	7.63	.91	2737.00	.04	.53	1.21	1.500	.000	.00	0	.0	
.329	.2566					.0395	.01	.35	2.89	.20	.013	.00	.00	PIPE		
-7005.442	2735.868	.319	2736.187	2.00	7.28	.82	2737.01	.04	.53	1.23	1.500	.000	.00	0	.0	
.292	.2566					.0345	.01	.36	2.71	.20	.013	.00	.00	PIPE		
-7005.150	2735.943	.329	2736.272	2.00	6.94	.75	2737.02	.03	.53	1.24	1.500	.000	.00	0	.0	
.248	.2566					.0302	.01	.36	2.54	.20	.013	.00	.00	PIPE		
-7004.903	2736.007	.341	2736.348	2.00	6.62	.68	2737.03	.03	.53	1.26	1.500	.000	.00	0	.0	
.221	.2566					.0264	.01	.37	2.38	.20	.013	.00	.00	PIPE		
-7004.682	2736.063	.352	2736.415	2.00	6.31	.62	2737.03	.03	.53	1.27	1.500	.000	.00	0	.0	
.189	.2566					.0230	.00	.38	2.23	.20	.013	.00	.00	PIPE		
-7004.493	2736.112	.364	2736.476	2.00	6.02	.56	2737.04	.03	.53	1.29	1.500	.000	.00	0	.0	
.161	.2566					.0202	.00	.39	2.09	.20	.013	.00	.00	PIPE		
-7004.332	2736.153	.377	2736.530	2.00	5.74	.51	2737.04	.02	.53	1.30	1.500	.000	.00	0	.0	
.140	.2566					.0176	.00	.40	1.95	.20	.013	.00	.00	PIPE		

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 2:58

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC19.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7004.191	2736.189	.390	2736.579	2.00	5.47	.46	2737.04	.02	.53	1.32	1.500	.000	.00	0 .0
.121	.2566					.0154	.00	.41	1.83	.20	.013	.00	.00	PIPE
-7004.070	2736.220	.403	2736.623	2.00	5.21	.42	2737.05	.02	.53	1.33	1.500	.000	.00	0 .0
.100	.2566					.0135	.00	.42	1.71	.20	.013	.00	.00	PIPE
-7003.970	2736.246	.417	2736.663	2.00	4.97	.38	2737.05	.02	.53	1.34	1.500	.000	.00	0 .0
.081	.2566					.0118	.00	.44	1.60	.20	.013	.00	.00	PIPE
-7003.889	2736.266	.432	2736.698	2.00	4.74	.35	2737.05	.02	.53	1.36	1.500	.000	.00	0 .0
.068	.2566					.0103	.00	.45	1.50	.20	.013	.00	.00	PIPE
-7003.821	2736.284	.447	2736.731	2.00	4.52	.32	2737.05	.02	.53	1.37	1.500	.000	.00	0 .0
.052	.2566					.0091	.00	.46	1.40	.20	.013	.00	.00	PIPE
-7003.770	2736.297	.463	2736.760	2.00	4.31	.29	2737.05	.01	.53	1.39	1.500	.000	.00	0 .0
.041	.2566					.0079	.00	.48	1.31	.20	.013	.00	.00	PIPE
-7003.729	2736.308	.479	2736.787	2.00	4.11	.26	2737.05	.01	.53	1.40	1.500	.000	.00	0 .0
.027	.2566					.0069	.00	.49	1.23	.20	.013	.00	.00	PIPE
-7003.701	2736.315	.496	2736.811	2.00	3.92	.24	2737.05	.01	.53	1.41	1.500	.000	.00	0 .0
.019	.2566					.0061	.00	.51	1.15	.20	.013	.00	.00	PIPE
-7003.683	2736.320	.513	2736.833	2.00	3.74	.22	2737.05	.01	.53	1.42	1.500	.000	.00	0 .0
.002	.2566					.0053	.00	.52	1.07	.20	.013	.00	.00	PIPE

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 3-2016 Time:10: 2:58

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC19.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7003.680	2736.320	.533	2736.853	2.00	3.55	.20	2737.05	.01	.53	1.44	1.500	.000	.00	0 .0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN2_FAC21.WSW   SHT
SO  -7308.6402713.300 18                    2718.250
R   -7289.4202713.684 18      .013                        0.000    .000 0
SH  -7289.4202713.684 18                       .000
CD  18  4              1.500
CD  24  4              2.000
CD  30  4              2.500
CD  36  4              3.000
CD  42  4              3.500
CD  48  4              4.000
CD  54  4              4.500
CD  60  4              5.000
CD  72  4              6.000
Q            2.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN2_FAC21.WSW SHT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7308.640	2713.300	4.950	2718.250	2.00	1.13	.02	2718.27	.00	.53	.00	1.500	.000	.00	0 .0
19.220	.0200					.0004	.01	4.95	.00	.37	.013	.00	.00	PIPE
-7289.420	2713.684	4.573	2718.257	2.00	1.13	.02	2718.28	.00	.53	.00	1.500	.000	.00	0 .0

HEC-RAS ANALYSIS

EXISTING CONDITIONS MAIN 1

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                    HEC-RAS Version 4.1.0 Jan 2010
                     U.S. Army Corps of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X        X
          X     X  X        X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX


PROJECT DATA
Project Title: Main 1 - Existing Condition
Project File : EXIST3.prj
Run Date and Time: 2/29/2016 11:05:34 AM

Project in English units


PLAN DATA

Plan Title: Main1
Plan File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\EXIST3.p02

          Geometry Title: Main1
          Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-
Main1\EXIST3.G01

          Flow Title    : Main1
          Flow File     : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-
Main1\EXIST3.F01

Plan Summary Information:
Number of:  Cross Sections =   26    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed at all cross sections
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow


FLOW DATA

Flow Title: Main1
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\EXIST3.F01

Flow Data (cfs)

  River          Reach          RS                  PF 1
  Unnamed Wash   Main1          2700                2128
```

Unnamed Wash	Main1	1700	2227
Unnamed Wash	Main1	1500	2472
Unnamed Wash	Main1	800	2493
Unnamed Wash	Main1	500	4209

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed Wash	Main1	PF 1	Critical	Known WS = 2684.83

GEOMETRY DATA

Geometry Title: Main1
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\EXIST3.G01

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2700

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2769	4.32	2768	8.89	2767	14.12	2766	19.18	2765
24.32	2764	29.44	2763	34.62	2762	39.85	2761	45	2760
48.3	2759	51.08	2758	54.15	2757	58.29	2756	74.22	2756
77.45	2757	80.08	2758	90.95	2758	94.1	2757	95.07	2757
97.37	2758	99.58	2759	100.37	2760	101.18	2761	101.97	2762
103.09	2763	105.64	2764	108.63	2765	112.52	2766	116.09	2767
119.56	2768	127.49	2769						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	127.49	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	127.49	95.75	98.69	107.97	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2600

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2765	3.19	2764	6.31	2763	9.41	2762	12.03	2761
12.88	2760	13.83	2759	14.76	2758	15.74	2757	16.76	2756
17.69	2755	18.58	2754	22.83	2752	32.12	2752	37.82	2754
43.67	2755	52.8	2756	66.54	2757	66.62	2758	66.71	2759
68.82	2761	68.85	2761	70.78	2759	71.78	2758	72.75	2757
86.93	2757	90.38	2758	91.7	2759	92.96	2760	94.15	2761
99.48	2762	104.49	2763	110.14	2764	115.64	2765		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	115.64	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	115.64	101.86	103.65	108.71	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2500

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2761	.38	2760	.75	2759	1.17	2758	1.89	2756
2.3	2755	2.68	2754	3.06	2753	3.44	2752	9.58	2748
17.77	2748	34.89	2752	60.1	2753	67.24	2754	71.71	2755
76.74	2756	84.67	2758	93.68	2759	99.64	2760	104.45	2761

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	104.45	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	104.45	108.74	100.43	96.31	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2400

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2758	15.42	2758	18.34	2757	21.01	2756	23.33	2755
24.99	2754	26.51	2753	29.64	2751	31.2	2750	33.06	2749
35.06	2748	37.36	2747	68.67	2749	90.83	2749	95.4	2751
98.61	2752	104.46	2754	109.02	2755	118.84	2756	121.79	2757
123.77	2758	126.1	2759	128.13	2759				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	128.13	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	128.13	109.52	114.22	121.17	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2300

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2757	13.08	2756	20.71	2755	24.77	2754	28.47	2753
32.13	2752	33.53	2751	34.62	2750	35.7	2749	36.76	2748
37.76	2747	39.95	2746	42.62	2745	49.66	2744	64.78	2744
70.38	2745	73.02	2746	74.87	2747	76.67	2748	78.26	2749
79.83	2750	83.9	2751	88.3	2752	92.1	2753	95.71	2754
99.67	2755	104.09	2756	108.38	2757	112.21	2758	115.85	2759
119.41	2760	122.82	2761	126.24	2762				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	126.24	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	126.24	191.53	193.81	198.19	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2200

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2752	8.53	2751	25.12	2749	33.08	2748	37.76	2747
41.77	2746	47.66	2745	50.99	2744	52.82	2743	54.58	2742
57.55	2741	61.05	2740	78.87	2740	83.65	2741	87.38	2742
89.14	2743	90.4	2744	91.6	2745	93.05	2746	95	2747
96.89	2748	98.01	2749	99.17	2750	100.55	2751	101.91	2752
103.89	2753	105.52	2754	107.21	2755	109.78	2756	113.41	2757
118.47	2758	127.18	2759						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	127.18	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	127.18	113.96	200.13	254.43	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2100

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2748	9.24	2747	16.89	2746	26.59	2744	37.05	2742
40.48	2741	42.68	2740	44.83	2739	47.03	2738	55.78	2736
78.8	2738	79.56	2739	80.33	2740	81.25	2741	83.37	2742
85.58	2743	93.92	2746	96.58	2747	132.68	2749	132.68	2751

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	132.68	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	132.68	231.94	197.1	162.04	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 2000

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2755	3.69	2754	10.93	2752	15.12	2751	19.95	2750
25.24	2749	30.66	2748	36.25	2747	40.5	2746	43.7	2745
46.08	2744	47.48	2743	48.3	2742	49.03	2741	49.79	2740
50.49	2739	51.12	2738	51.7	2737	52.34	2736	52.87	2735
53.42	2734	54.05	2733	54.84	2732	56.08	2731	57.36	2730
58.7	2729	72.73	2729	74.05	2730	77.94	2731	82.11	2732
84.74	2733	87.34	2734	89.95	2735	107.65	2737	116.39	2738
137.36	2739								

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	116.39	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.

0	137.36	231.62	197.66	162.89	.1	.3	

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1900

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2760	7.86	2759	8.62	2758	9.33	2757	10.1	2756
12.21	2754	14.17	2753	16.04	2752	17.72	2751	19.29	2750
22.45	2748	24.24	2747	26.07	2746	27.89	2745	29.73	2744
31.59	2743	33.35	2742	35.09	2741	37.27	2740	39.81	2739
42.41	2738	43.87	2737	44.98	2736	46.08	2735	46.55	2734
47.14	2733	47.96	2732	49.45	2730	50.64	2729	51.77	2728
52.93	2727	54.04	2726	55.19	2725	56.32	2724	69.55	2724
69.74	2725	69.88	2726	70.03	2727	70.55	2728	72.22	2729
75.51	2729	80.71	2729	83.34	2730	86.02	2731	88.45	2732
90.22	2733	91.95	2734	94.33	2735	96.69	2736	99.84	2737
102.86	2738	105.74	2739	124.05	2740	124.05	2741		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	105.74	.03

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	124.05	122.47	101.94	85.19	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1800

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2740	3.91	2746	13.58	2747	27.29	2747	40.79	2744
44.66	2743	46.27	2742	47.87	2741	49.53	2740	51.08	2739
54.43	2737	56.3	2736	58.22	2735	60.13	2734	63.04	2732
64.1	2731	64.52	2730	64.99	2729	65.44	2728	66.35	2726
66.79	2725	67.28	2724	67.73	2723	68.2	2722	69.12	2720
75.66	2719	79.29	2721	79.87	2722	80.21	2723	80.48	2724
80.76	2725	81.02	2726	81.44	2727	82.21	2728	83.08	2729
83.9	2730	84.67	2731	86.85	2732	92.81	2732	94.63	2732
100.04	2732	102.44	2731	104.77	2730	115.2	2730	116.94	2731
118.67	2732	120.41	2733	122.2	2734	125.27	2735	129.23	2736
133.96	2737	139.92	2738	148.25	2737				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	148.25	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	148.25	140.2	137.49	140.54	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1700

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2737	1.25	2737	11.94	2735	15.37	2734	18.84	2733

22.36	2732	26.44	2731	32.09	2730	36.2	2729	39.93	2726
40.4	2725	40.83	2724	41.29	2723	42.62	2720	43.08	2719
43.53	2718	43.95	2717	44.26	2716	52.91	2717	52.98	2718
53.05	2719	53.18	2720	53.54	2722	54.25	2723	54.56	2724
54.58	2725	54.7	2726	55.93	2727	57.21	2728	61.3	2729
62.1	2730	62.82	2731	64.63	2731	65.76	2730	72.27	2730
75.99	2731	92.39	2732						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	92.39	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	92.39	145.9	141.68	135.05	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1600

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2730	.84	2730	3.34	2729	5.76	2728	8.34	2727
10.96	2726	13.73	2725	16.56	2724	18.7	2723	19.54	2722
20.05	2721	20.5	2720	20.95	2719	21.4	2718	21.81	2717
22.7	2715	23.18	2714	23.61	2713	24.1	2712	25.18	2711
32.35	2711	32.43	2712	32.46	2713	32.51	2714	32.51	2715
32.55	2716	32.61	2717	32.63	2718	32.73	2719	32.76	2720
32.87	2721	33	2722	33.08	2723	33.17	2724	41.32	2725
47.05	2724	57.68	2725	64.05	2727	72.68	2728	75.19	2729
79.21	2730								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	79.21	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	79.21	132.22	129.11	128.4	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1500

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2739	5.25	2739	10.38	2738	11.16	2737	11.88	2736
12.54	2735	13.99	2733	15.85	2732	19.53	2730	20.91	2729
22.3	2728	25.12	2726	26.47	2725	27.51	2723	27.95	2722
28.38	2721	28.86	2720	29.24	2719	29.73	2718	30.09	2717
30.55	2716	30.96	2715	31.37	2714	31.75	2713	32.14	2712
32.55	2711	32.96	2710	36.88	2707	40.43	2707	40.71	2708
41.04	2709	41.4	2710	41.76	2711	42.06	2712	42.35	2713
42.61	2714	42.89	2715	43.12	2716	44.34	2717	46.18	2718
48.75	2719	51.54	2720	53.99	2721	56.32	2722	58.52	2723
60.88	2724	63.2	2725	65.05	2726	66.91	2727	68.83	2728
70.84	2729	73.94	2730	79.58	2732	81.97	2733		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	81.97	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	81.97	270.26	260.99	251.15	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1400

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2720	6.86	2719	11.59	2718	21.44	2715	25.17	2713
30.02	2710	30.88	2709	31.6	2708	33	2706	33.73	2705
34.42	2704	41.24	2702.26	42.26	2702	45.17	2702	45.29	2704
45.32	2705	45.5	2708	45.52	2709	45.55	2710	46.41	2711
48.5	2712	50.57	2713	52.69	2714	55.15	2715	70.98	2715
75.09	2714	78.35	2713	81.16	2712	84.24	2711	87.41	2710
90.89	2709								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	90.89	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	90.89	197.2	199.44	199.87	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
70.98	90.89	2715

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1300

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2712	4.99	2710	14.86	2706	17.55	2705	22.21	2704
27.42	2703	29.49	2702	31.48	2701	36.81	2700	41.74	2699
45.01	2699	64.83	2699	67.91	2700	70.18	2701	71.28	2702
72.3	2703	73.52	2704	75.03	2705	76.39	2706	77.9	2707
81.18	2709	84.68	2711	89.2	2713	90.51	2714	91.21	2715
91.91	2716	92.61	2717	93.31	2718	94.06	2719		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	94.06	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	94.06	170	195.8	223.9	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1200

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2716	.24	2716	10.59	2714	13.66	2713	16.72	2712
19.16	2711	19.86	2710	20.62	2709	21.34	2708	22.05	2707
22.77	2706	23.47	2705	24.18	2704	24.9	2703	25.61	2702
26.28	2701	27.17	2700	29.23	2699	30.97	2698	35.17	2696
37.91	2695	64.52	2696	67.8	2697	69.22	2698	70.64	2699
70.83	2700	70.92	2701	71.09	2702	71.2	2703	71.31	2704
71.7	2705	72.21	2706	72.72	2707	73.17	2708	73.65	2709
74.08	2710	74.34	2711	77.17	2712	80.26	2713	86.35	2715
100	2716								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	100	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	100	199.59	208.99	220.51	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1100

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2707	5.35	2707	8.38	2706	9.68	2705	12.44	2703
13.93	2702	15.38	2701	17.01	2700	18.58	2699	21.52	2697
22.94	2696	26.14	2694	29.68	2693	34.53	2692	38.4	2691
56.38	2691	57.13	2692	57.9	2693	59.43	2695	60.24	2696
61.29	2697	62.43	2698	63.9	2699	65.12	2700	66.01	2701
66.45	2702	66.68	2703	66.92	2704	74.91	2705		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	74.91	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	74.91	173.12	189.13	202.7	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1000

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2700	1.85	2697	4.99	2695	7.03	2694	9.01	2693
15.23	2690	17.81	2689	23.14	2688	37.9	2687.36	46.38	2687
53.45	2687	55.47	2688	56.45	2689	56.76	2690	57.1	2691
57.5	2692	59.29	2694	60.1	2695	60.84	2696	61.57	2697
62.25	2698	62.94	2699	67.06	2701	69.55	2702	72.11	2703
72.82	2704	73.47	2705	75.18	2707	77.09	2708	82.18	2709

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	82.18	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	82.18	200.05	199.88	200.05	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 900

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2697	2.01	2696	6.96	2693	8.56	2692	9.68	2691
10.78	2690	11.92	2689	13	2688	14.12	2687	15.2	2686
16.3	2685	17.24	2684	26.67	2683	30.04	2683	41.4	2683
45.22	2684	46.68	2685	47.87	2686	48.94	2687	50.02	2688
51.05	2689	52.27	2690	53.58	2691	54.05	2692	54.3	2693

54.53	2694	61.14	2696	68.17	2697	76.52	2697

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	76.52	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	76.52	200.06	199.87	200.06	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 800

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2695	5.28	2694	9.97	2693	16.15	2691	17.35	2690
18.64	2689	19.91	2688	21.18	2687	22.6	2686	24.45	2685
26.51	2684	28.59	2683	29.67	2682	30.77	2681	31.87	2680
41.31	2679	45.06	2679	53.43	2679	55.64	2680	57.69	2681
59.22	2682	60.74	2683	62.39	2684	64.07	2685	65.7	2686
67.32	2687	69.12	2688	70.94	2689	72.73	2690	76.3	2692
78.37	2693	88.81	2695						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	88.81	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	88.81	200	199.91	200	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 700

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2692	13.46	2690	20.83	2689	24.82	2688	26.72	2687
27.64	2686	28.5	2685	29.4	2684	30.34	2683	31.24	2682
32.5	2681	33.91	2680	35.36	2679	36.22	2678	37	2677
40.67	2676	49.89	2676	60.98	2676	63.89	2677	65.31	2678
66.7	2679	68.22	2680	70.18	2681	72.05	2682	73.98	2683
75.51	2684	76.92	2685	78.38	2686	79.79	2687	82.47	2688
85.76	2689	93.54	2689						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	93.54	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	93.54	105.58	90.05	91.05	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 600

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2691	2.03	2691	4.75	2690	14.29	2689	26.04	2688
33.69	2687	34.32	2686	34.69	2685	35.04	2684	35.4	2683

35.71	2682	36.05	2681	36.46	2680	37.14	2679	39.75	2678
42.44	2677	44.85	2676	46.95	2675	49.06	2674	61.8	2674
76.28	2675	80.1	2676	83.77	2677	89.32	2679	91.29	2680
93.62	2681	96.54	2682	98.84	2683	106.09	2683	110.53	2682
112.97	2682	122.92	2682	123.43	2681	124.01	2680	124.46	2679
124.94	2678	125.31	2677	125.68	2676	126.77	2675	128.15	2674
139.97	2675	142.29	2676	144.19	2677	146.82	2678	149.09	2679
151.09	2680	153.17	2681	156.53	2682	159.47	2683	165.89	2685
167.92	2686	170.23	2687	172.74	2688				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	172.74	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	172.74	165.96	163.56	169.79	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
106.09	172.74	2690	F

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 500

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2687	16.29	2686	33.47	2685	48.37	2684	54.57	2683
62.81	2681	65.1	2680	67.73	2679	70.01	2678	72.24	2677
73.94	2676	77.08	2673	90.18	2672.27	94.92	2672	106.5	2672
113.63	2673	126.37	2676	128.11	2677	129.52	2678	131.24	2679
134.08	2680	139.43	2681	153.77	2683	159.91	2684	162.55	2685
164.37	2686	166.37	2687	168.53	2688	187.05	2690		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.03	48.37	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	187.05	58.23	51.31	62.51	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 400

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2688.01	6.8	2685	9.24	2684	16.28	2683	28.94	2683
32.59	2684	36.71	2685	41.98	2685	55.92	2684	78.44	2684
97.61	2684	98.46	2683	100.13	2681	100.9	2680	101.76	2679
102.54	2678	103.66	2677	105.88	2676	108.08	2675	110.35	2674
112.62	2673	114.93	2672	118.66	2671	154.09	2671	157.32	2672
159.33	2673	161.13	2674	161.97	2675	162.88	2676	163.89	2677
164.96	2678	166.09	2679	167.41	2680	171.11	2683	177.76	2683
204.74	2683	212.73	2684	215.85	2685	218.94	2686	222.3	2687
235.52	2689								

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.03	97.61	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	235.52	116.72	99.89	88.03	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 300

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2686.85	10.18	2687	26.16	2686	56.92	2685	67.77	2683
72.93	2682	74.69	2681	75.93	2680	77.09	2679	78.28	2678
80.13	2677	81.83	2676	83.53	2675	85.1	2674	89.88	2672
92.95	2671	96.11	2670	99.27	2669	125.7	2669	131	2670
133.85	2671	140.06	2673	144.25	2674	149.79	2676	153.27	2677
159.33	2679	162.93	2680	173.51	2681	187.26	2682	195.52	2683
202	2684	207.73	2685	212.52	2686	216.49	2687	220.29	2688

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.03	56.92	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	220.29	145.1	100.88	52	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 200

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2693	1.64	2692	3.32	2691	5.46	2690	7.61	2689
9.35	2688	11.06	2687	12.77	2686	14.47	2685	16.25	2684
18.24	2683	23	2682	25.51	2681	28.74	2680	31.03	2679
31.44	2678	32.35	2676	33	2675	33.89	2674	34.55	2673
35.14	2672	35.58	2671	36.12	2670	36.63	2669	37.08	2668
38.91	2668	40.82	2668	41.23	2669	41.7	2670	42.11	2671
42.85	2672	43.48	2673	44.25	2674	46.26	2675	49.04	2676
59.12	2678	63.36	2679	66.9	2680	70.72	2681	82.01	2682
117.78	2683	123.57	2684	125.81	2685	127.96	2686	130.18	2687
132.3	2688	134.11	2689	135.75	2690	137.7	2691		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	137.7	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	137.7	.3	.5

SUMMARY OF MANNING'S N VALUES

River:Unnamed Wash

Reach	River Sta.	n1	n2	n3
Main1	2700	.035	.035	.035
Main1	2600	.035	.035	.035
Main1	2500	.035	.035	.035
Main1	2400	.035	.035	.035
Main1	2300	.035	.035	.035
Main1	2200	.035	.035	.035
Main1	2100	.035	.035	.035
Main1	2000	.035	.03	
Main1	1900	.035	.03	
Main1	1800	.035	.035	.035

Main1	1700	.035	.035	.035
Main1	1600	.035	.035	.035
Main1	1500	.035	.035	.035
Main1	1400	.035	.035	.035
Main1	1300	.035	.035	.035
Main1	1200	.035	.035	.035
Main1	1100	.035	.035	.035
Main1	1000	.035	.035	.035
Main1	900	.035	.035	.035
Main1	800	.035	.035	.035
Main1	700	.035	.035	.035
Main1	600	.035	.035	.035
Main1	500	.03	.035	
Main1	400	.03	.035	
Main1	300	.03	.035	
Main1	200	.035	.035	.035

SUMMARY OF REACH LENGTHS

River: Unnamed Wash

Reach	River Sta.	Left	Channel	Right
Main1	2700	95.75	98.69	107.97
Main1	2600	101.86	103.65	108.71
Main1	2500	108.74	100.43	96.31
Main1	2400	109.52	114.22	121.17
Main1	2300	191.53	193.81	198.19
Main1	2200	113.96	200.13	254.43
Main1	2100	231.94	197.1	162.04
Main1	2000	231.62	197.66	162.89
Main1	1900	122.47	101.94	85.19
Main1	1800	140.2	137.49	140.54
Main1	1700	145.9	141.68	135.05
Main1	1600	132.22	129.11	128.4
Main1	1500	270.26	260.99	251.15
Main1	1400	197.2	199.44	199.87
Main1	1300	170	195.8	223.9
Main1	1200	199.59	208.99	220.51
Main1	1100	173.12	189.13	202.7
Main1	1000	200.05	199.88	200.05
Main1	900	200.06	199.87	200.06
Main1	800	200	199.91	200
Main1	700	105.58	90.05	91.05
Main1	600	165.96	163.56	169.79
Main1	500	58.23	51.31	62.51
Main1	400	116.72	99.89	88.03
Main1	300	145.1	100.88	52
Main1	200			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Unnamed Wash

Reach	River Sta.	Contr.	Expan.
Main1	2700	.1	.3
Main1	2600	.1	.3
Main1	2500	.1	.3
Main1	2400	.1	.3
Main1	2300	.1	.3
Main1	2200	.1	.3
Main1	2100	.1	.3
Main1	2000	.1	.3
Main1	1900	.1	.3

Main1	1800	.1	.3
Main1	1700	.1	.3
Main1	1600	.1	.3
Main1	1500	.1	.3
Main1	1400	.1	.3
Main1	1300	.1	.3
Main1	1200	.1	.3
Main1	1100	.1	.3
Main1	1000	.1	.3
Main1	900	.1	.3
Main1	800	.1	.3
Main1	700	.1	.3
Main1	600	.1	.3
Main1	500	.1	.3
Main1	400	.1	.3
Main1	300	.1	.3
Main1	200	.3	.5

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Main1

River: Unnamed Wash Reach: Main1 RS: 2700 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2600 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2500 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2400 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2300 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2200 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2100 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 2000 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1800 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Unnamed Wash Reach: Main1 RS: 1700 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.

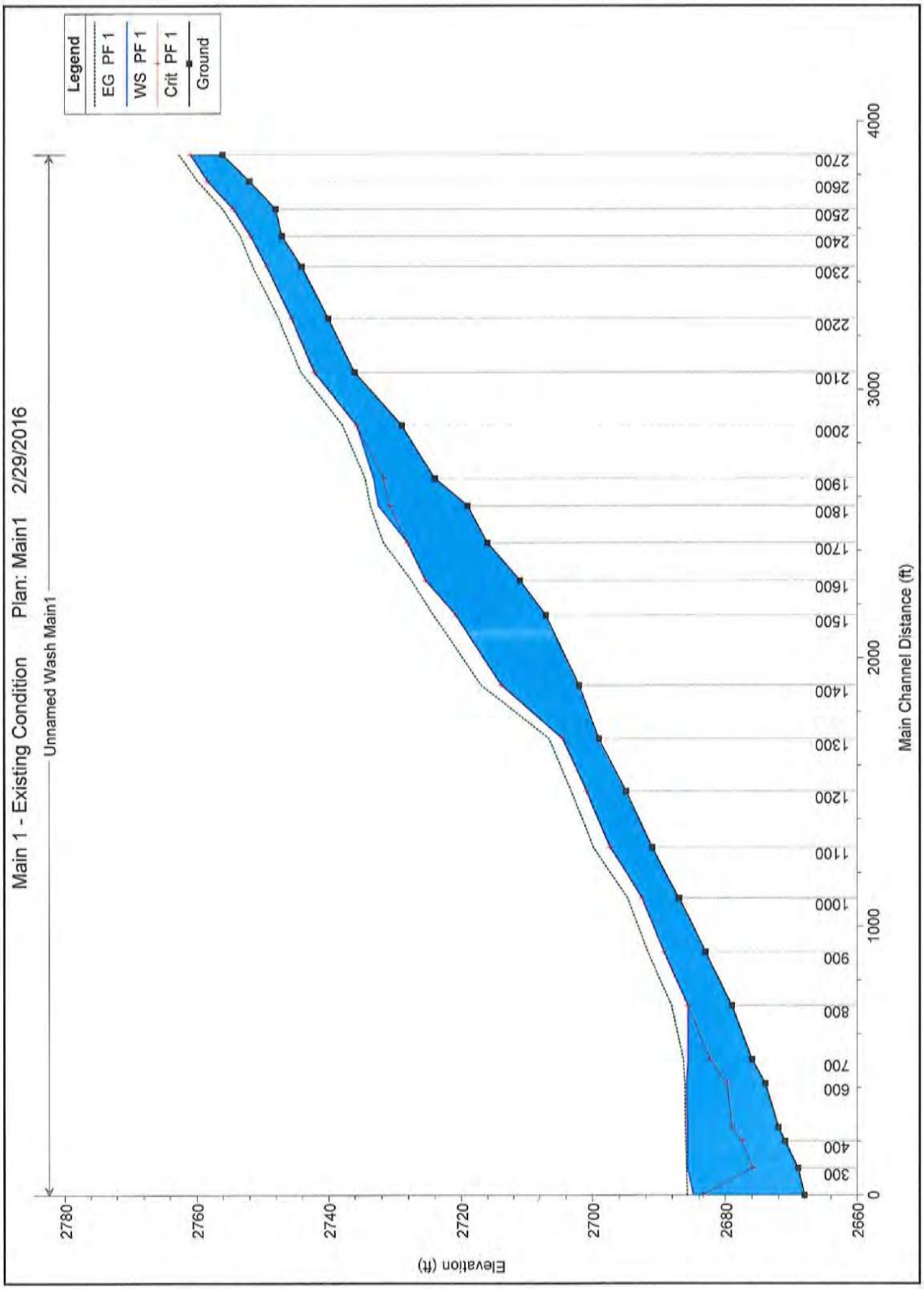
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1600 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1500 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1400 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1300 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1200 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

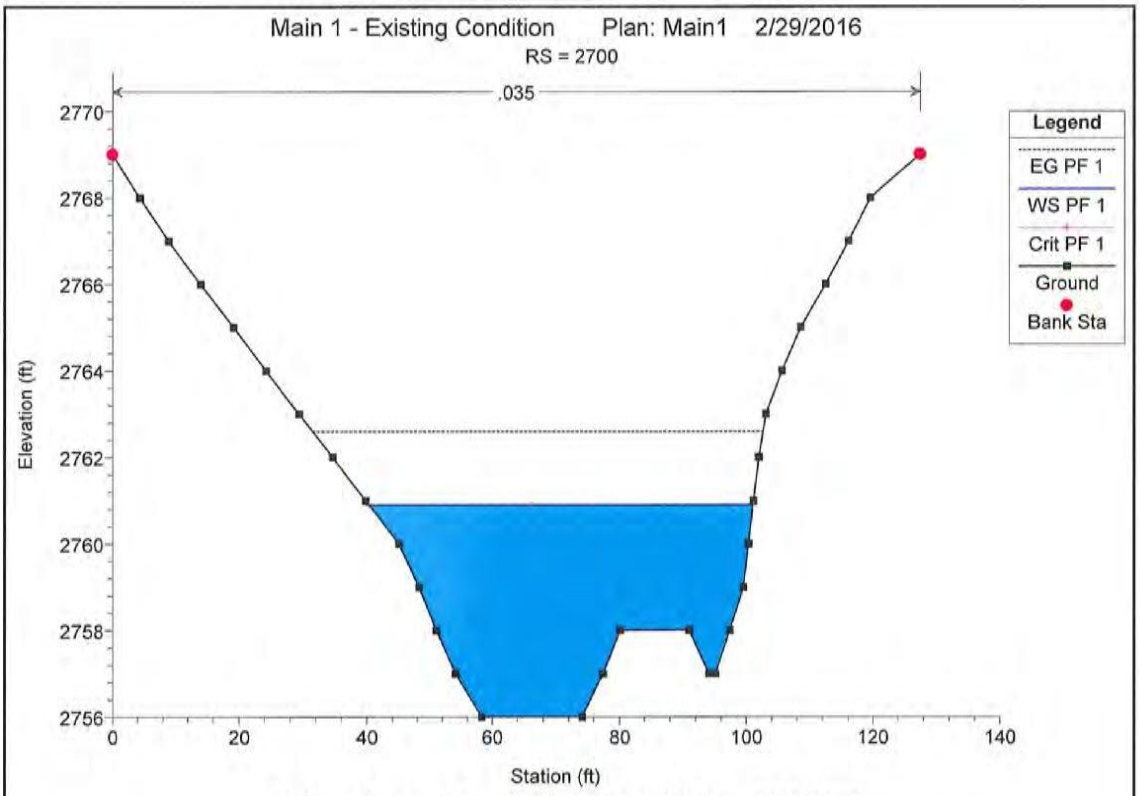
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1100 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1000 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 900 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 800 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 700 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Unnamed Wash Reach: Main1 RS: 600 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Wash Reach: Main1 RS: 300 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

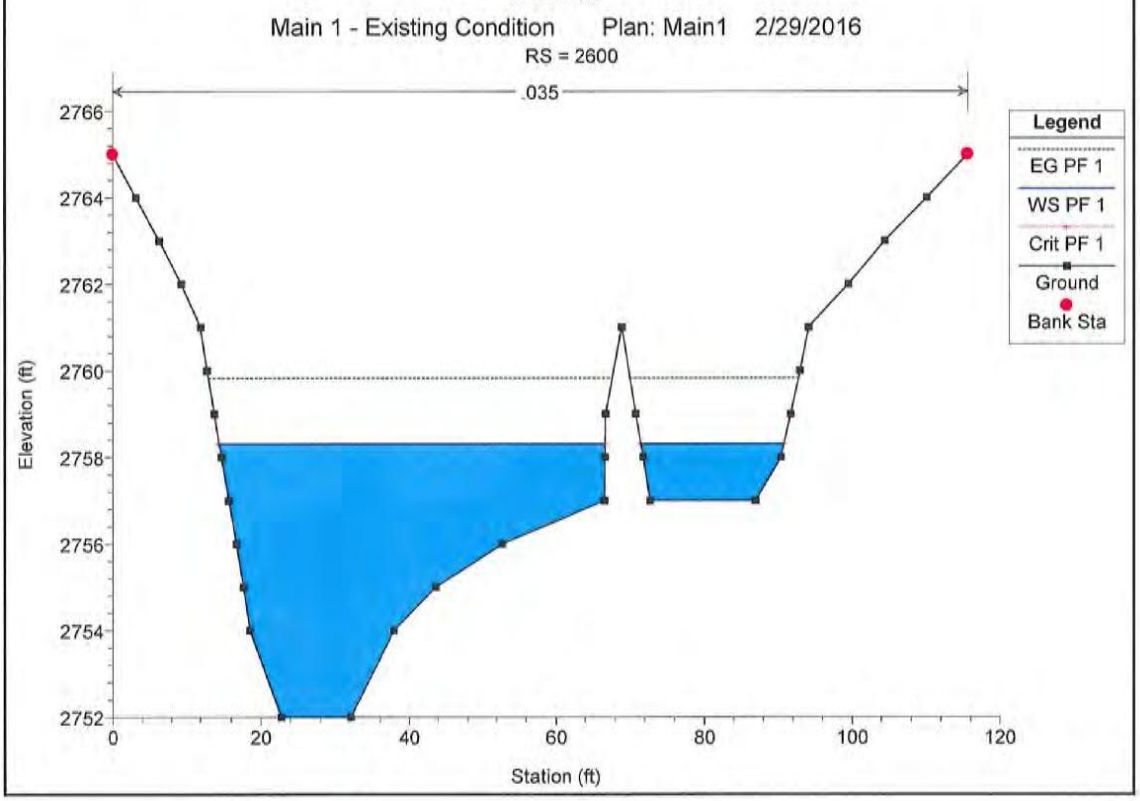
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

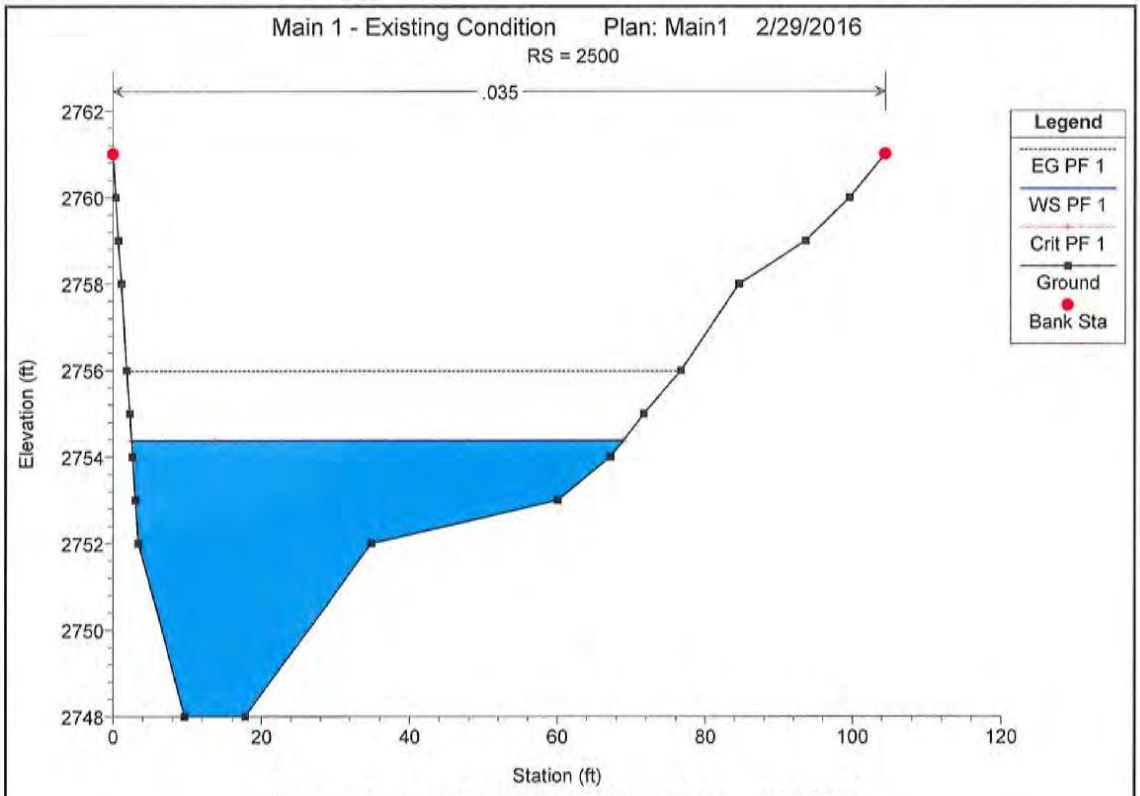
HEC-RAS Plan: Main1 River: Unnamed Wash Reach: Main1 Profile: PF 1

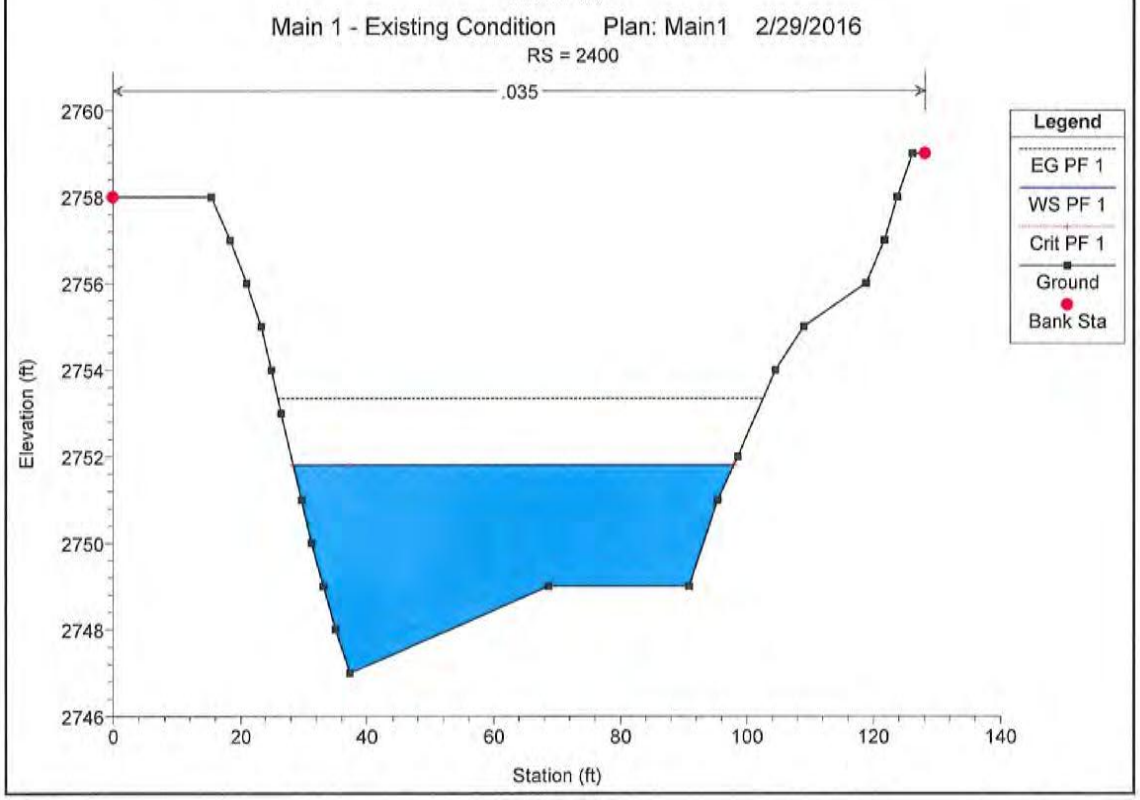
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main1	2700	PF 1	2128.00	2756.00	2760.89	2760.89	2762.59	0.012774	10.46	203.44	60.70	1.01
Main1	2600	PF 1	2128.00	2752.00	2758.31	2758.31	2759.83	0.013663	9.90	214.95	71.48	1.01
Main1	2500	PF 1	2128.00	2748.00	2754.37	2754.37	2755.99	0.013412	10.20	208.57	66.36	1.01
Main1	2400	PF 1	2128.00	2747.00	2751.80	2751.80	2753.34	0.012747	9.95	213.77	69.59	1.00
Main1	2300	PF 1	2128.00	2744.00	2749.36	2749.36	2751.48	0.012119	11.68	182.19	43.51	1.01
Main1	2200	PF 1	2128.00	2740.00	2745.49	2745.49	2747.48	0.012174	11.33	187.75	47.51	1.00
Main1	2100	PF 1	2128.00	2736.00	2742.08	2742.08	2744.08	0.012150	11.35	187.55	46.89	1.00
Main1	2000	PF 1	2128.00	2729.00	2735.65	2735.65	2737.77	0.012614	11.69	181.96	43.15	1.00
Main1	1900	PF 1	2128.00	2724.00	2733.14	2731.64	2734.38	0.005770	8.94	237.92	43.40	0.67
Main1	1800	PF 1	2128.00	2719.00	2732.45	2730.71	2733.66	0.008664	8.80	241.76	57.08	0.75
Main1	1700	PF 1	2227.00	2716.00	2728.08	2728.08	2731.68	0.019678	15.22	146.31	20.20	1.00
Main1	1600	PF 1	2227.00	2711.00	2725.34	2725.34	2727.46	0.018419	11.67	190.81	45.98	1.01
Main1	1500	PF 1	2472.00	2707.00	2720.77	2720.77	2724.15	0.018525	14.77	167.39	24.93	1.00
Main1	1400	PF 1	2472.00	2702.00	2713.84	2713.84	2716.92	0.016275	14.09	175.47	28.74	1.00
Main1	1300	PF 1	2472.00	2699.00	2704.43	2704.43	2706.46	0.012057	11.42	216.42	53.98	1.01
Main1	1200	PF 1	2472.00	2695.00	2700.84	2700.84	2703.15	0.012205	12.19	202.78	44.49	1.01
Main1	1100	PF 1	2472.00	2691.00	2697.30	2697.30	2699.76	0.012233	12.57	196.64	40.56	1.01
Main1	1000	PF 1	2472.00	2687.00	2692.52	2692.52	2694.72	0.012304	11.89	207.98	47.97	1.01
Main1	900	PF 1	2472.00	2683.00	2689.15	2689.15	2691.63	0.011974	12.63	195.65	39.48	1.00
Main1	800	PF 1	2493.00	2679.00	2685.65	2685.65	2688.05	0.011853	12.43	200.60	41.88	1.00
Main1	700	PF 1	2493.00	2676.00	2685.62	2682.23	2686.39	0.002350	7.03	354.61	49.85	0.46
Main1	600	PF 1	2493.00	2674.00	2685.89	2679.63	2686.14	0.000568	4.01	621.90	133.33	0.24
Main1	500	PF 1	4209.00	2672.00	2685.74	2678.92	2686.03	0.000687	4.33	971.83	143.10	0.29
Main1	400	PF 1	4209.00	2671.00	2685.77	2677.39	2685.97	0.000532	3.56	1181.20	213.18	0.27
Main1	300	PF 1	4209.00	2669.00	2685.77	2675.79	2685.92	0.000296	3.04	1382.45	178.22	0.19
Main1	200	PF 1	4209.00	2668.00	2684.83	2683.29	2685.76	0.004590	7.74	543.77	110.66	0.62

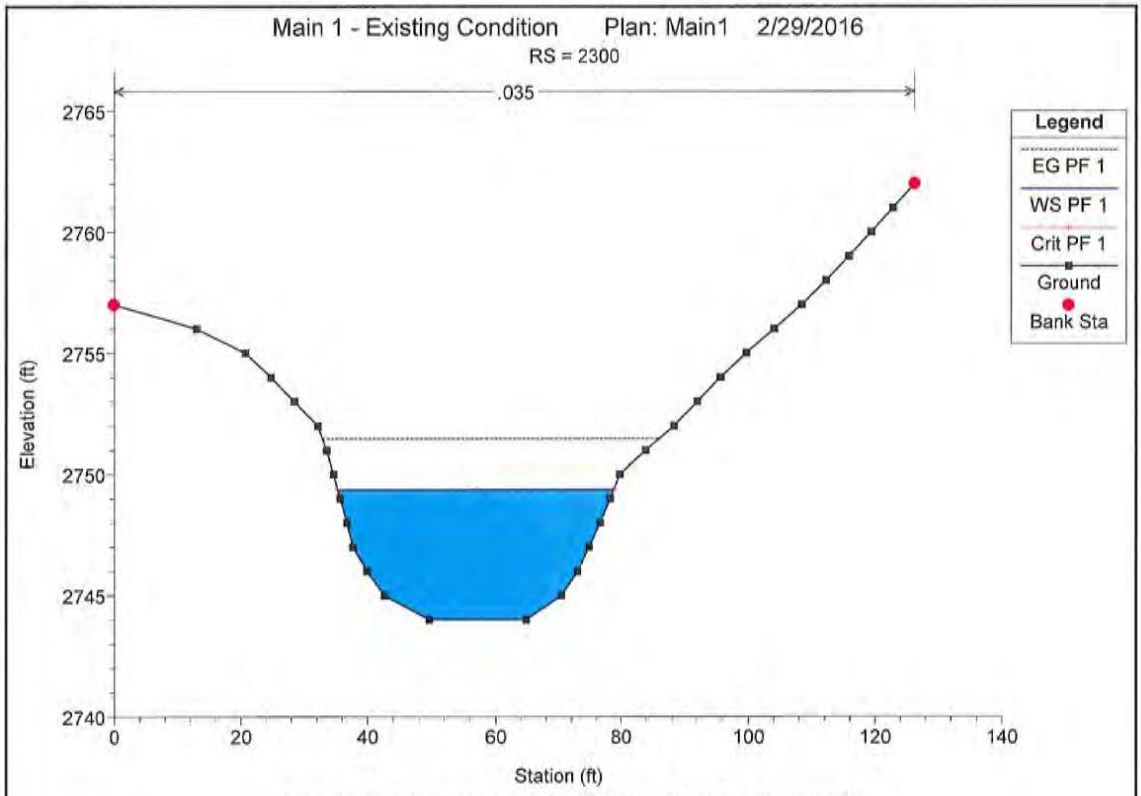

Main 1 - Existing Condition Plan: Main1 2/29/2016
Unnamed Wash Main1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
2660
2680
2700
2720
2740
2760
2780
Main Channel Distance (ft)
0
1000
2000
3000
4000
300
400
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700

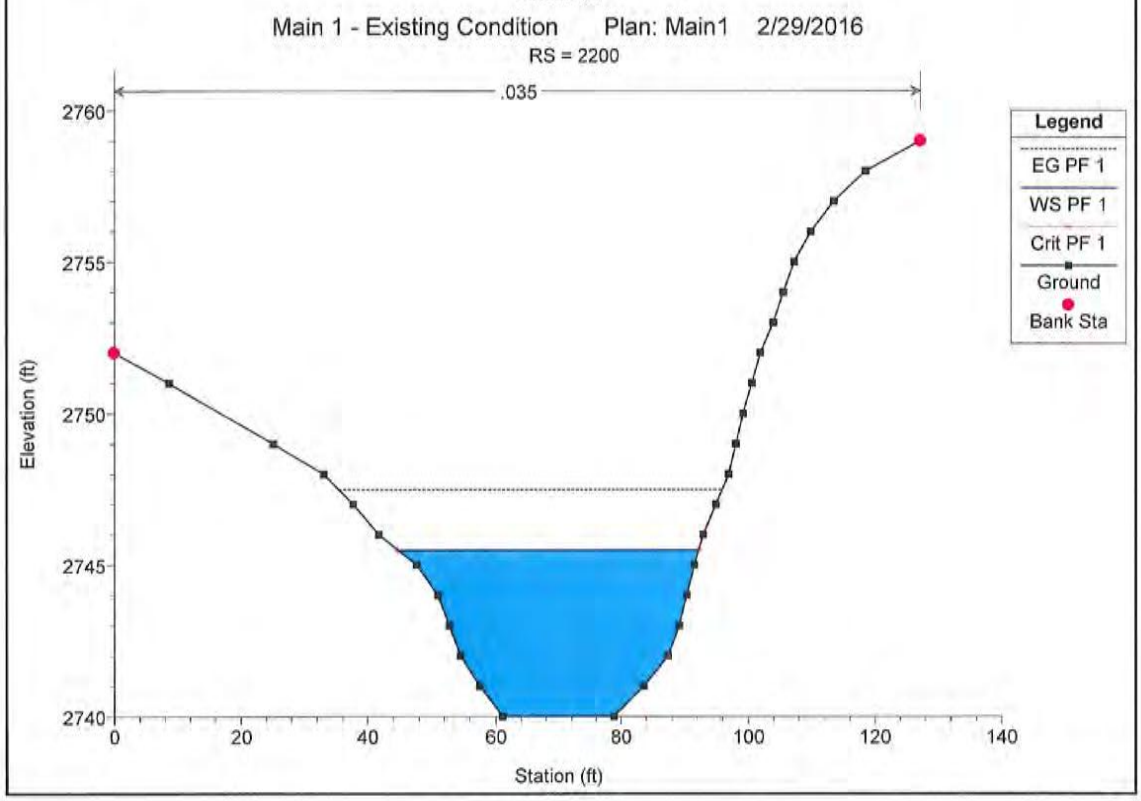

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2700
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

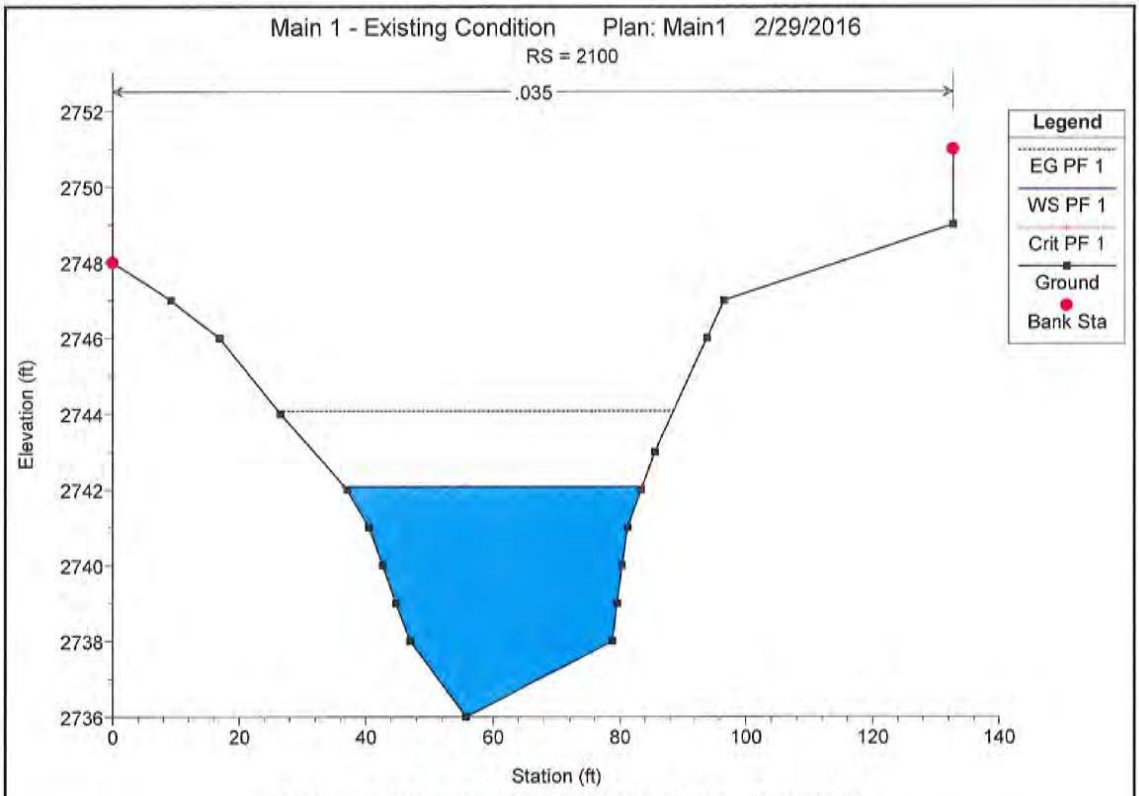

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2600
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

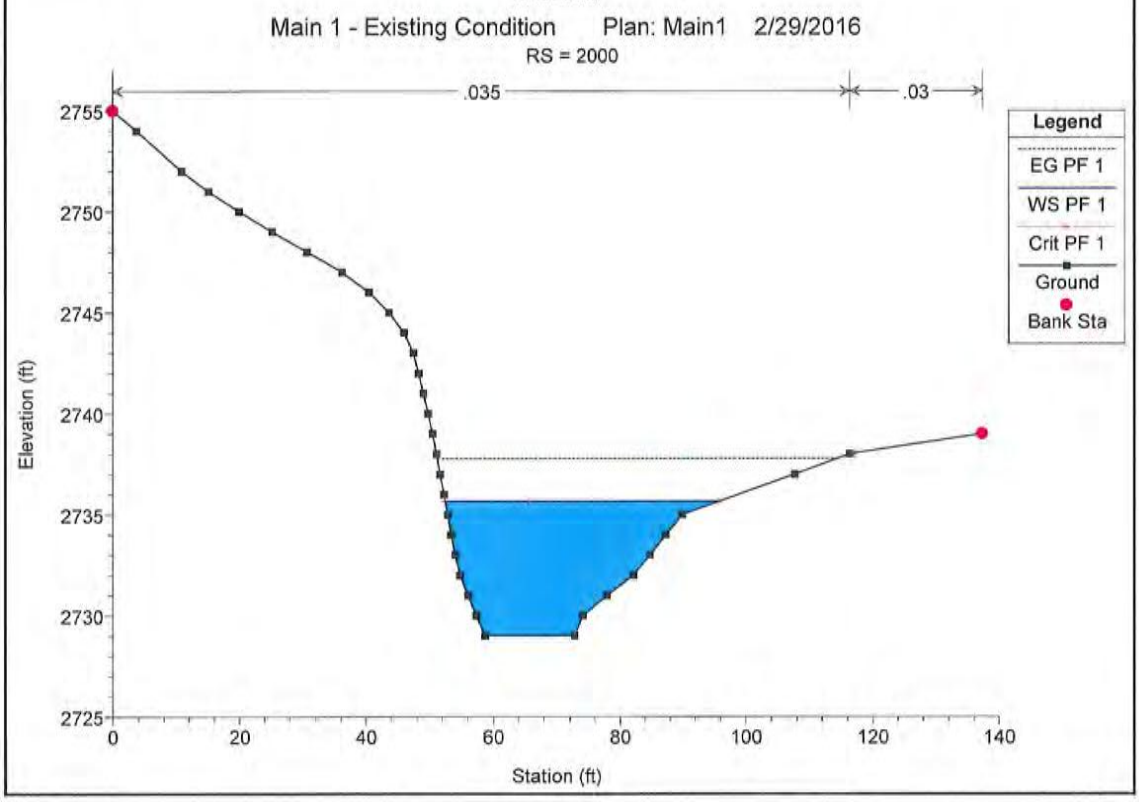

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2500
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

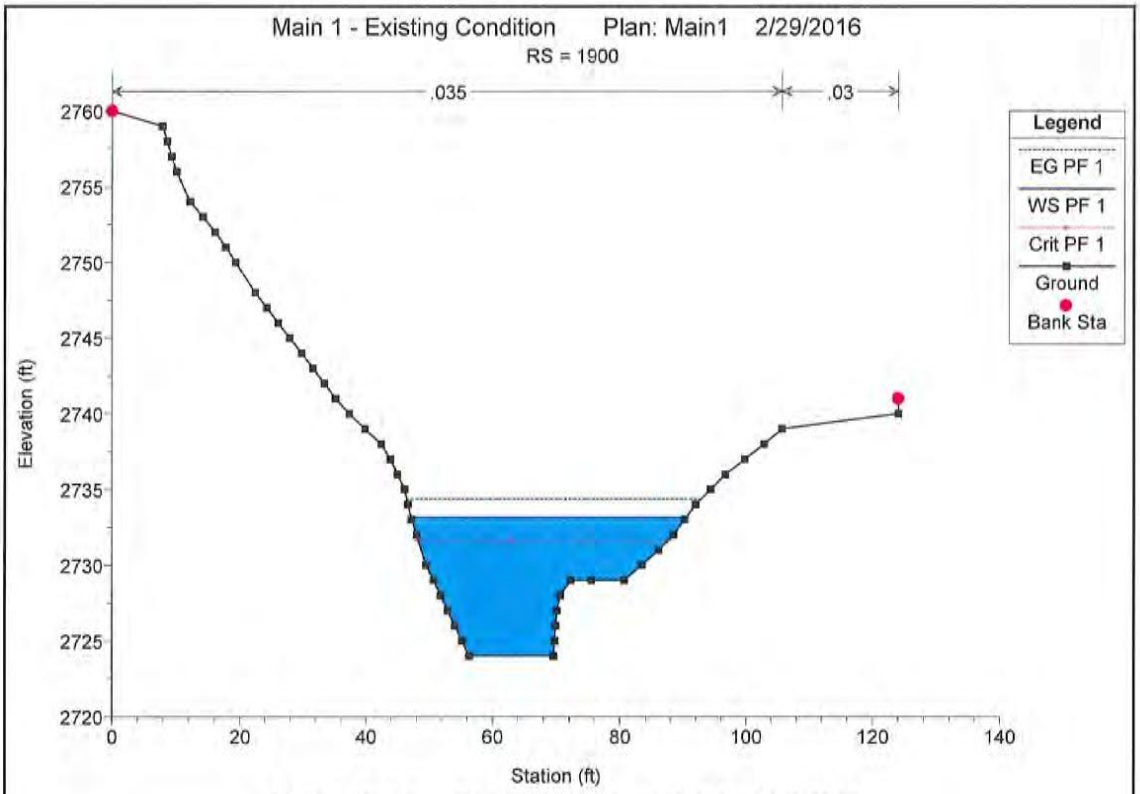

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2400
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

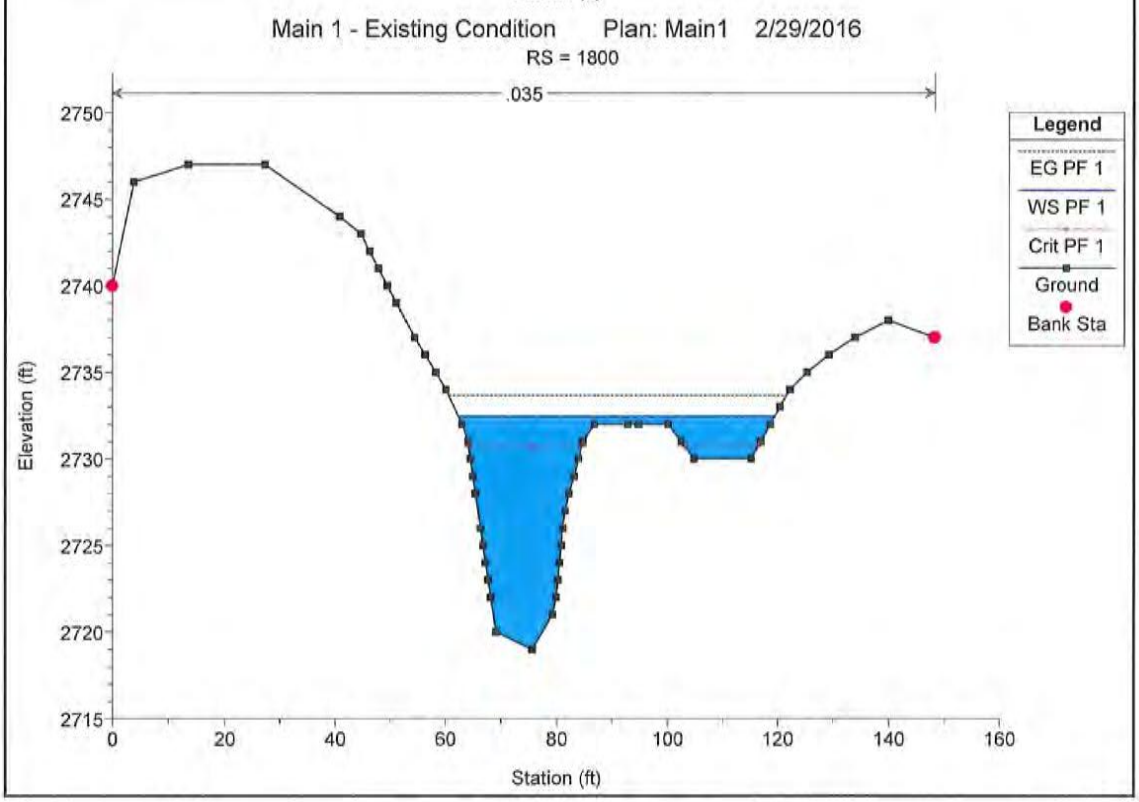

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2300
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2765
2760
2755
2750
2745
2740
0
20
40
60
80
100
120
140

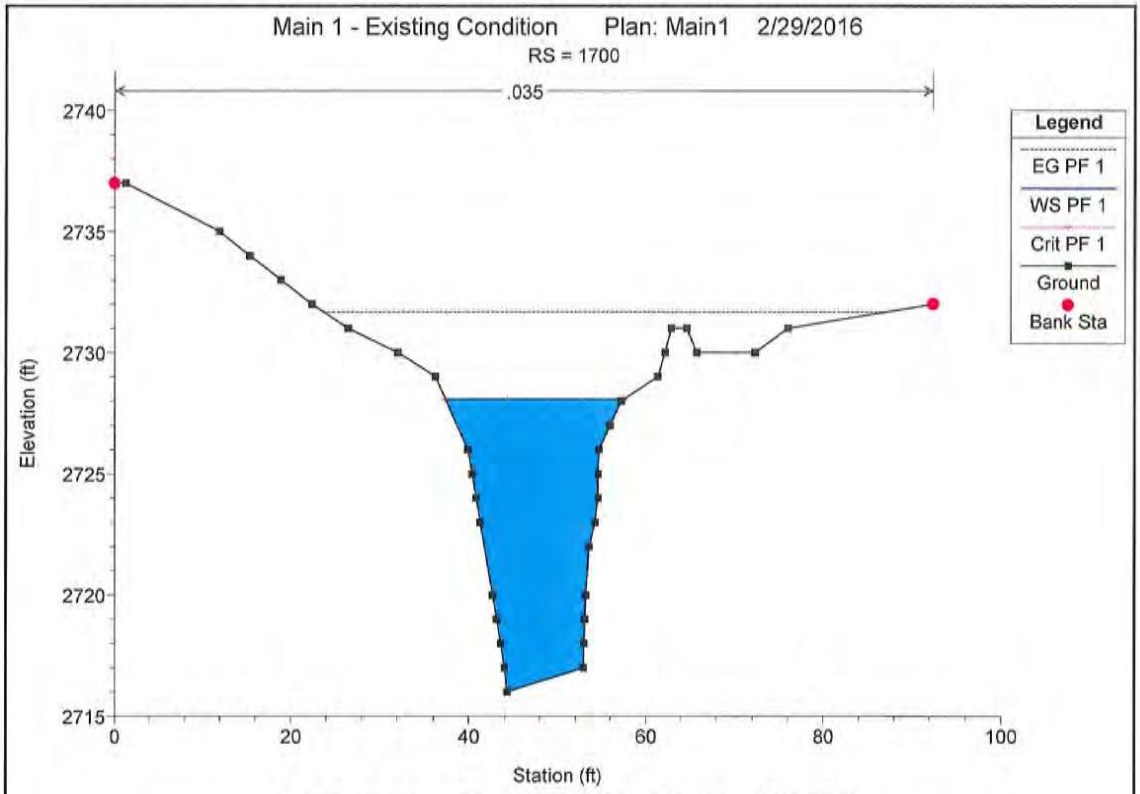

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2200
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2760
2755
2750
2745
2740
0
20
40
60
80
100
120
140

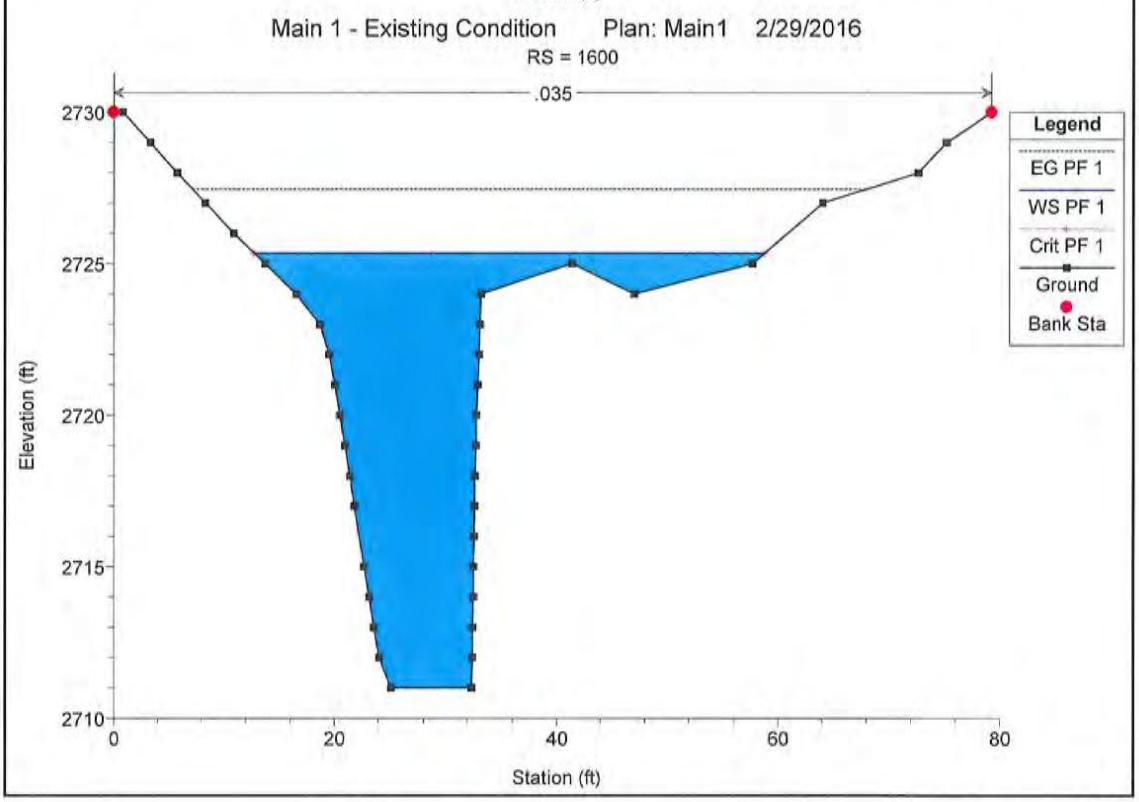

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2100
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

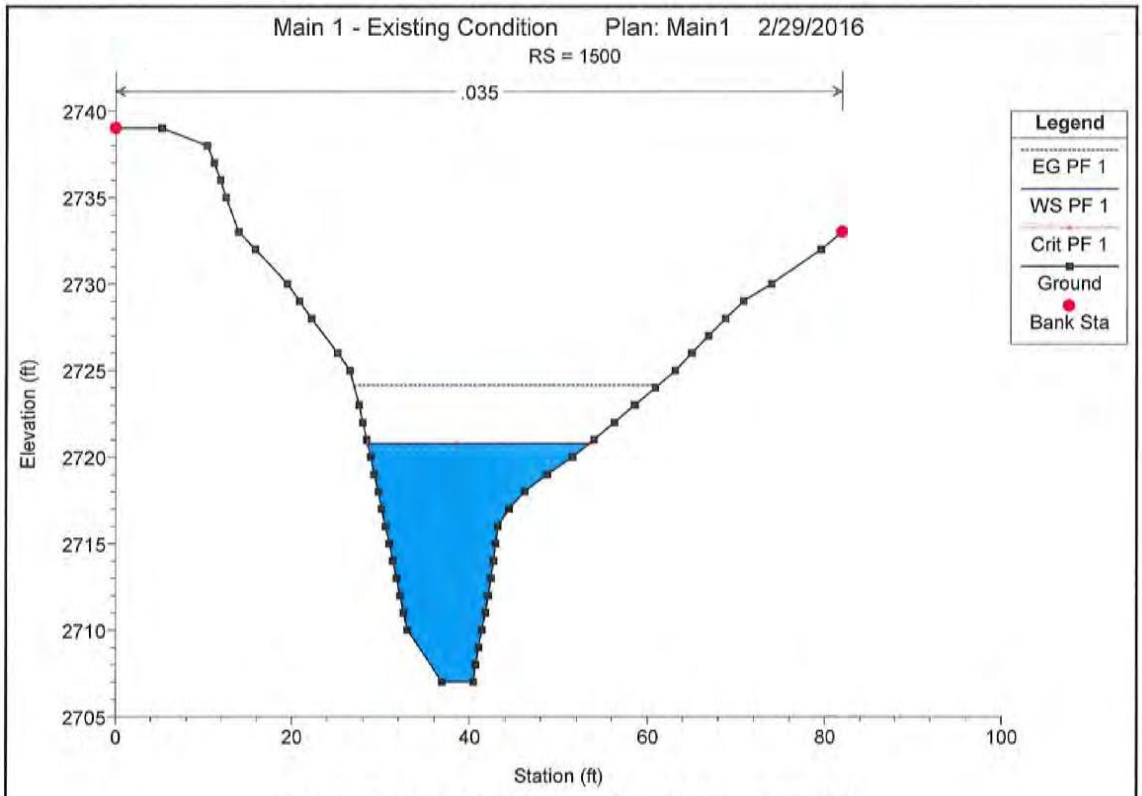

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 2000
.035
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

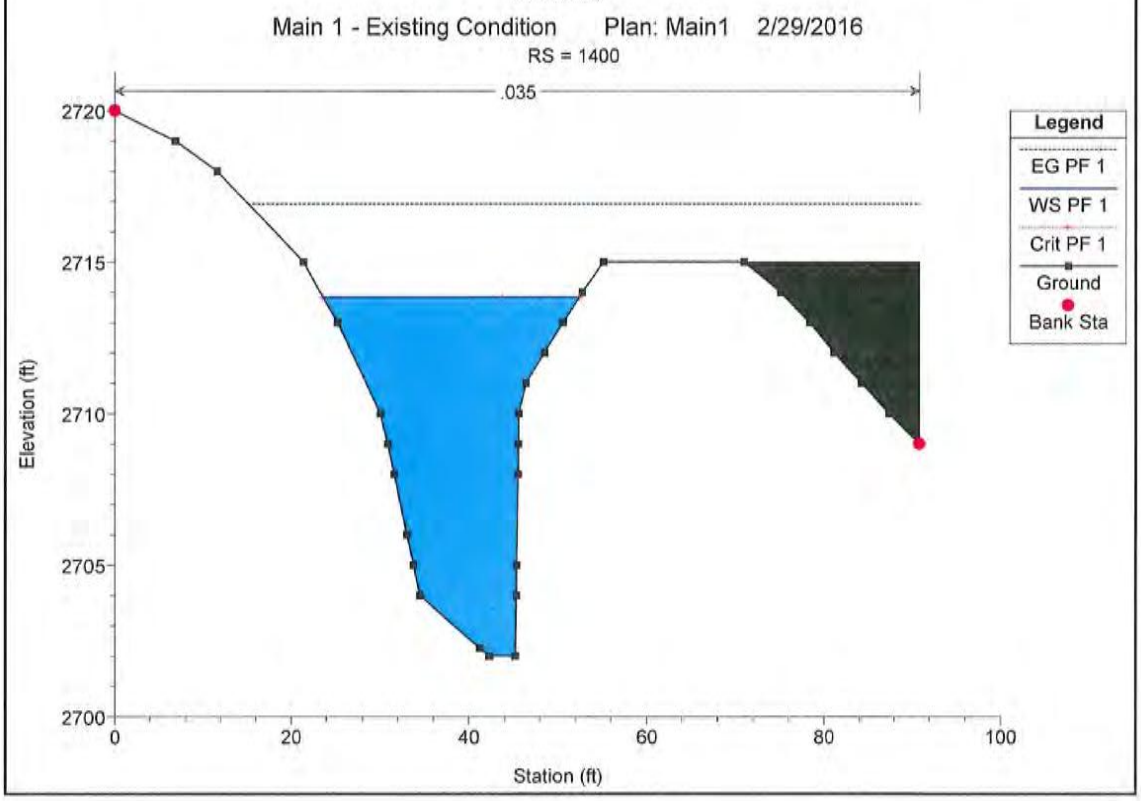

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1900
.035
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

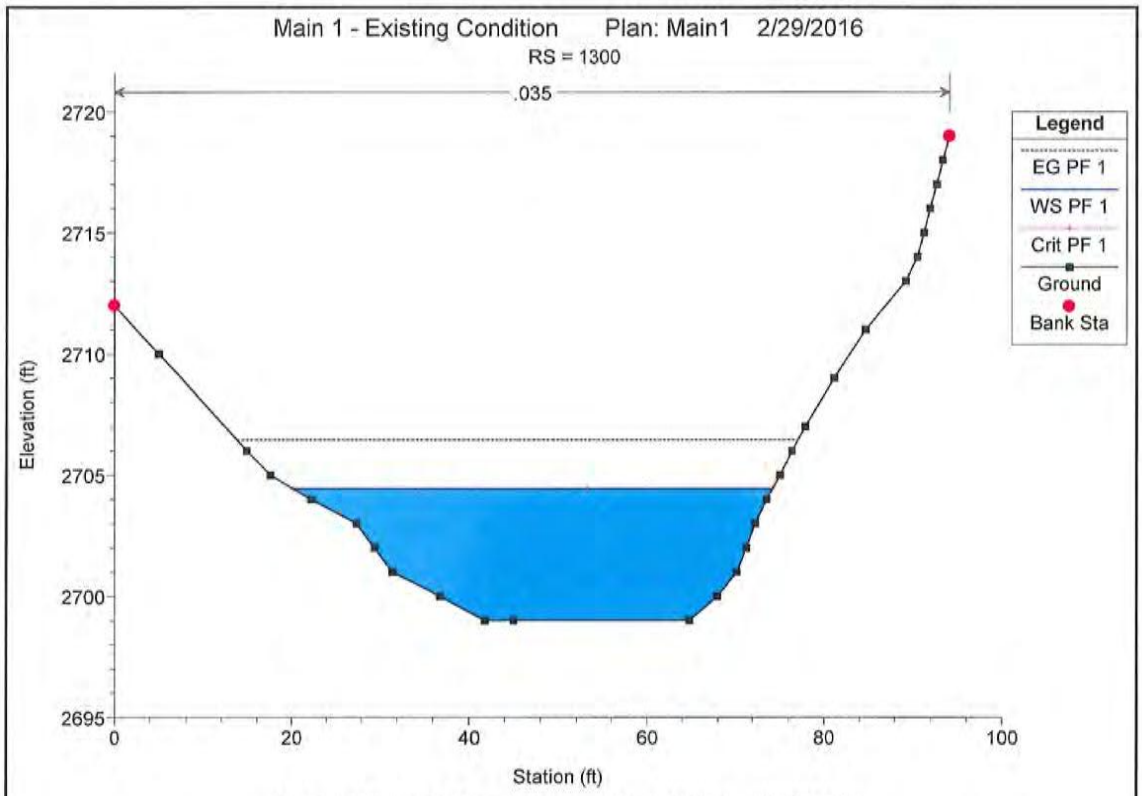

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1800
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

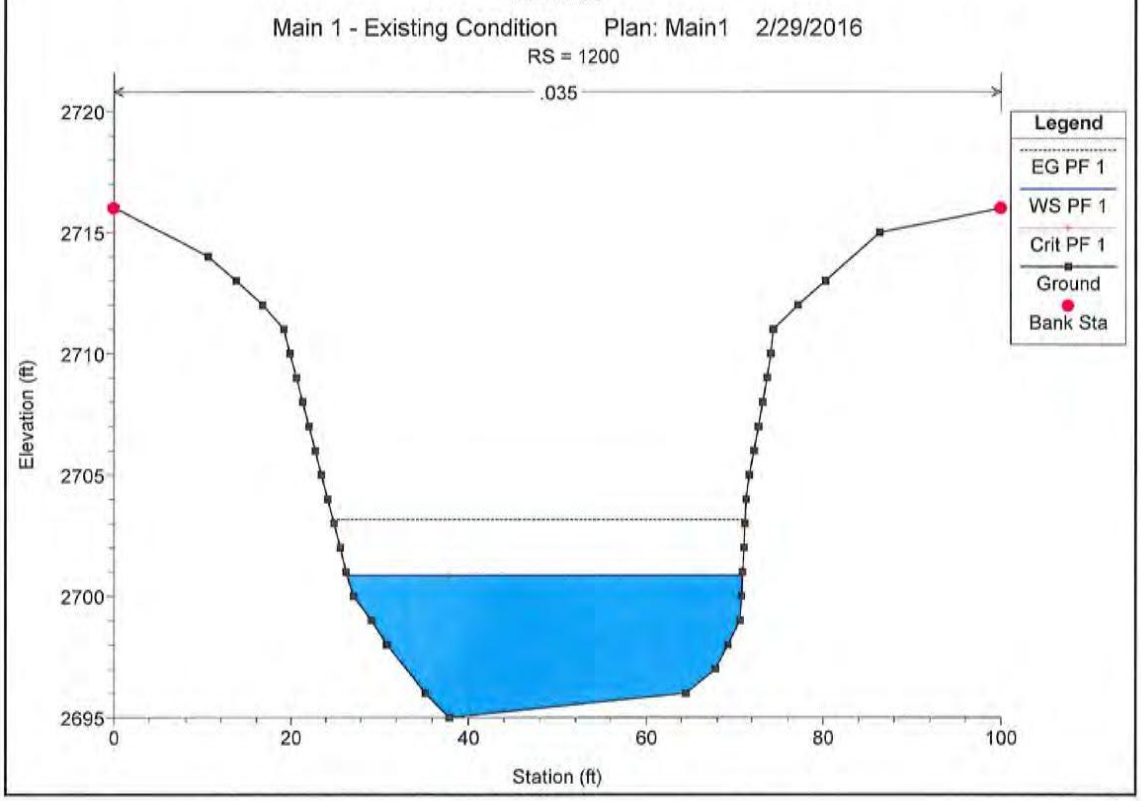

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1700
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2740
2735
2730
2725
2720
2715
0
20
40
60
80
100

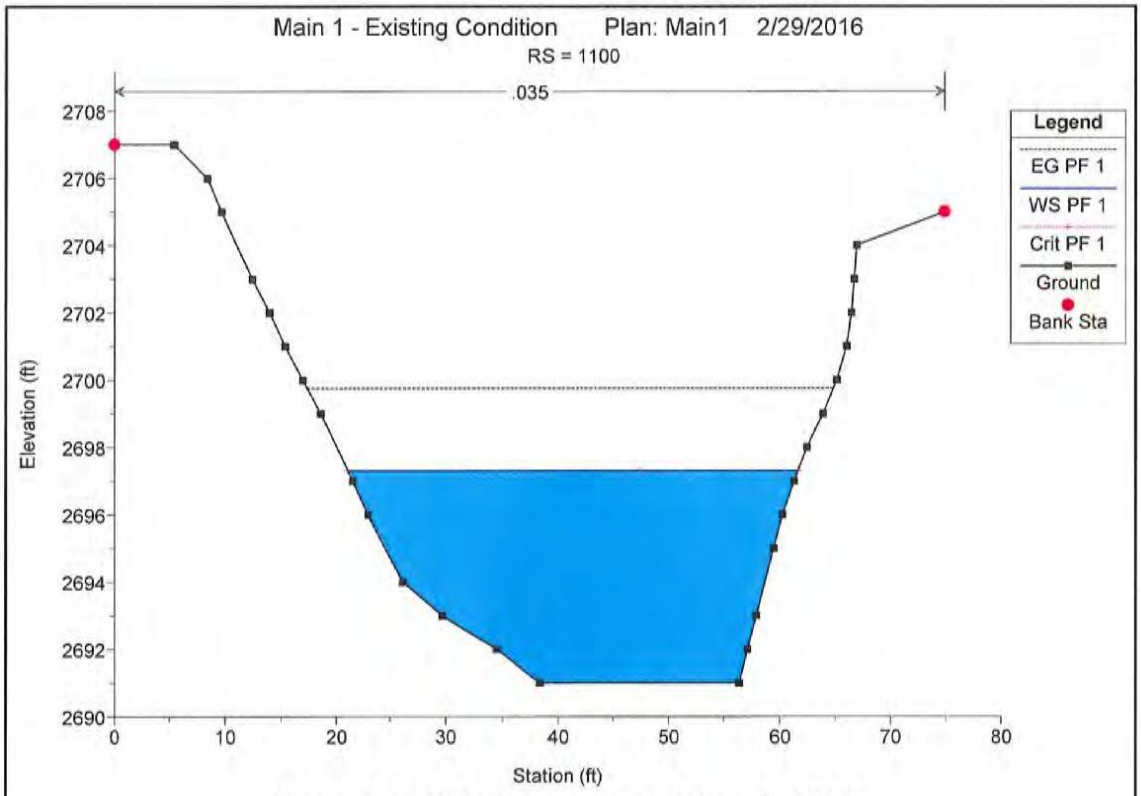

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1600
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2730
2725
2720
2715
2710
0
20
40
60
80

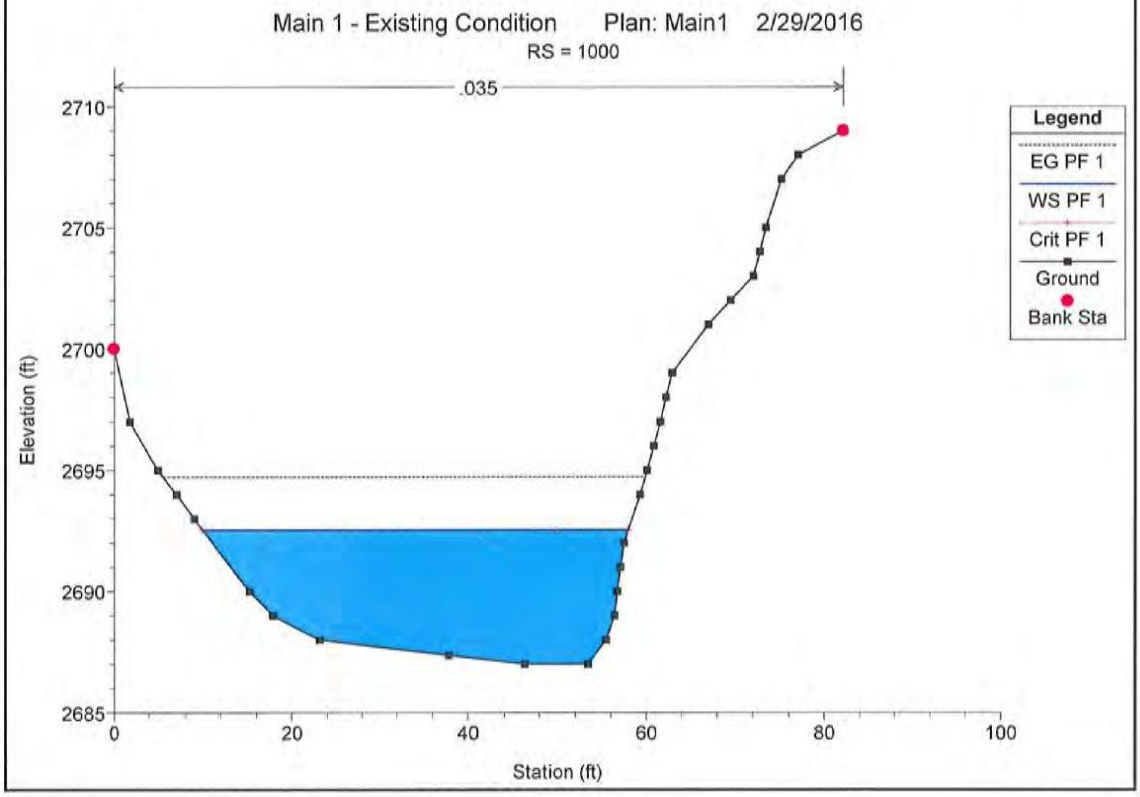

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1500
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

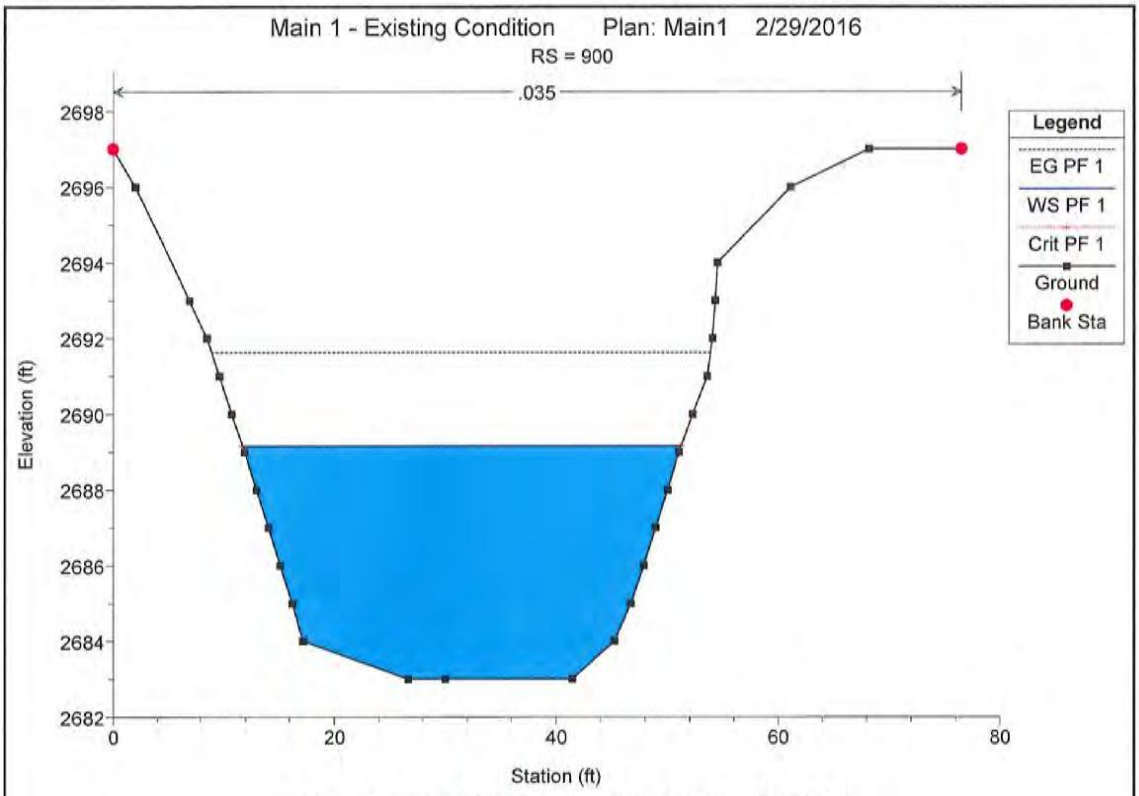

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1400
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

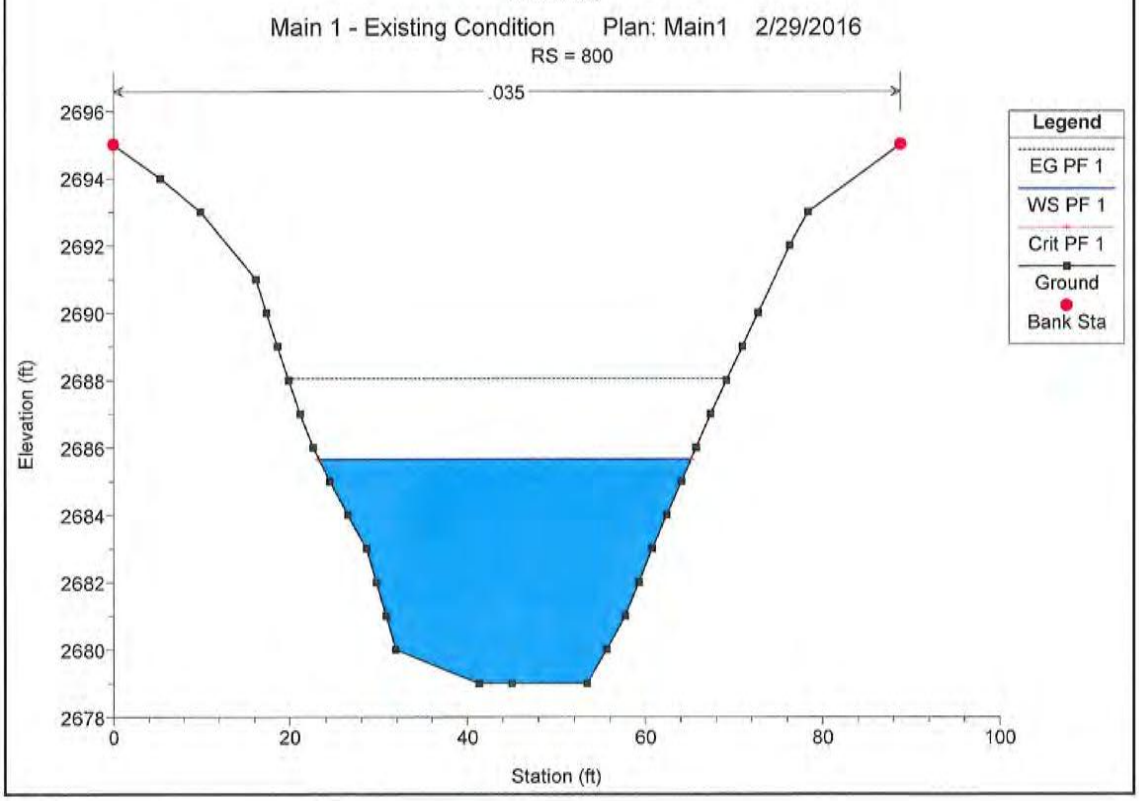

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1300
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2720
2715
2710
2705
2700
2695
0
20
40
60
80
100

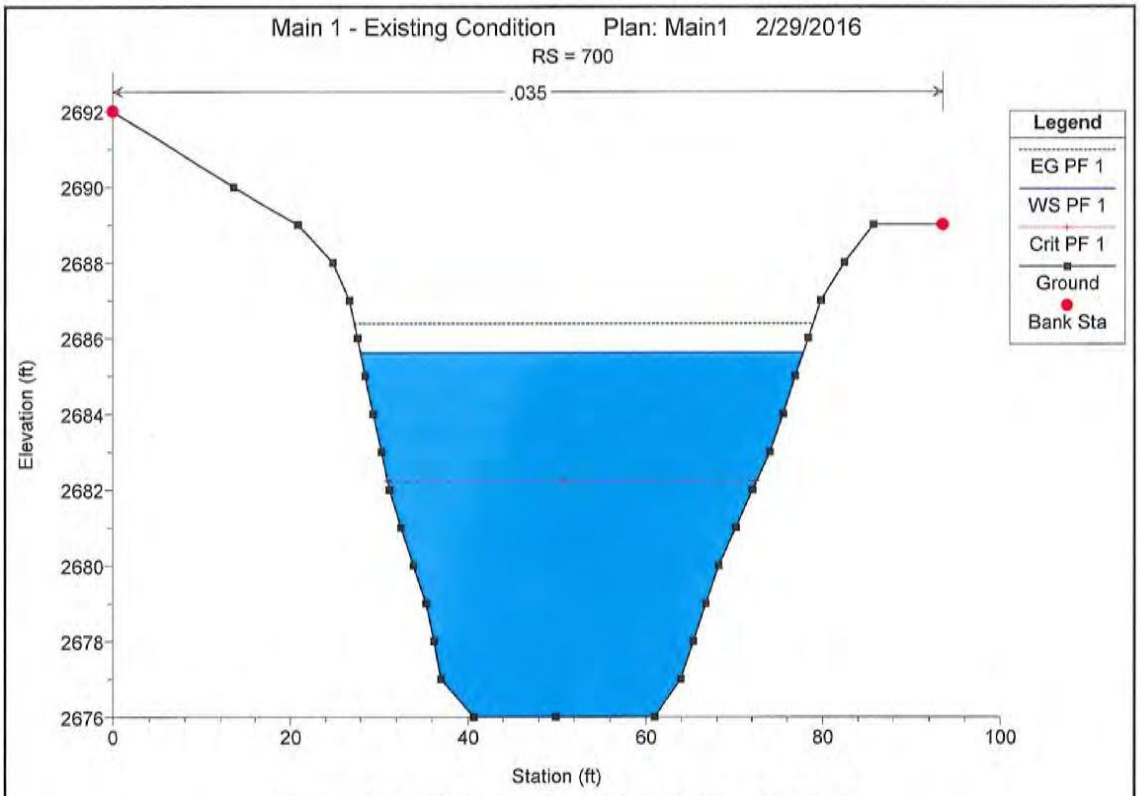

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1200
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2720
2715
2710
2705
2700
2695
0
20
40
60
80
100

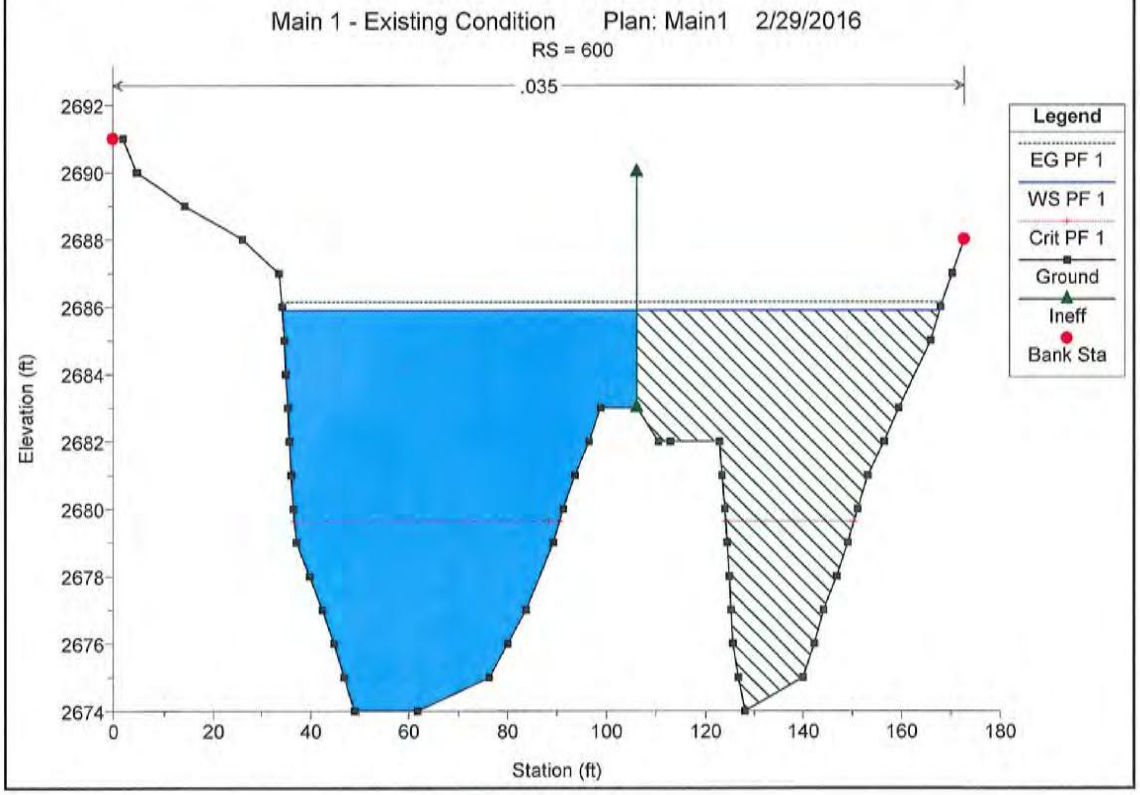

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1100
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

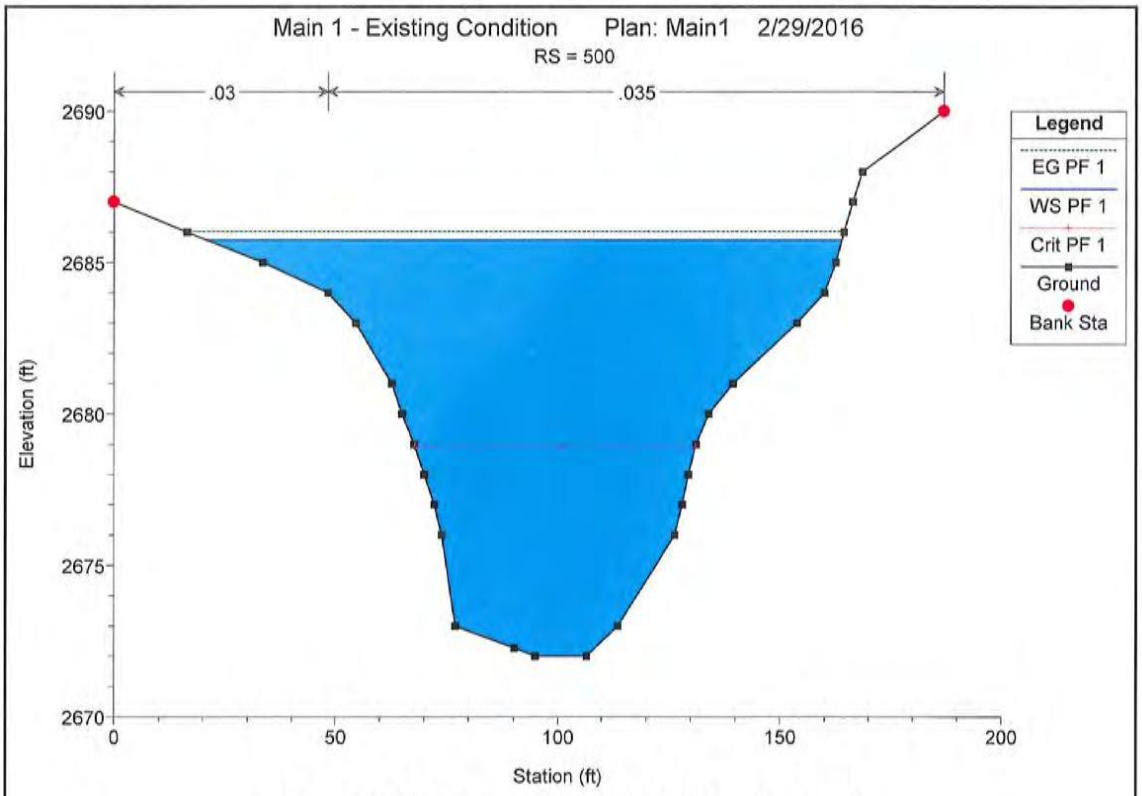

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 1000
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

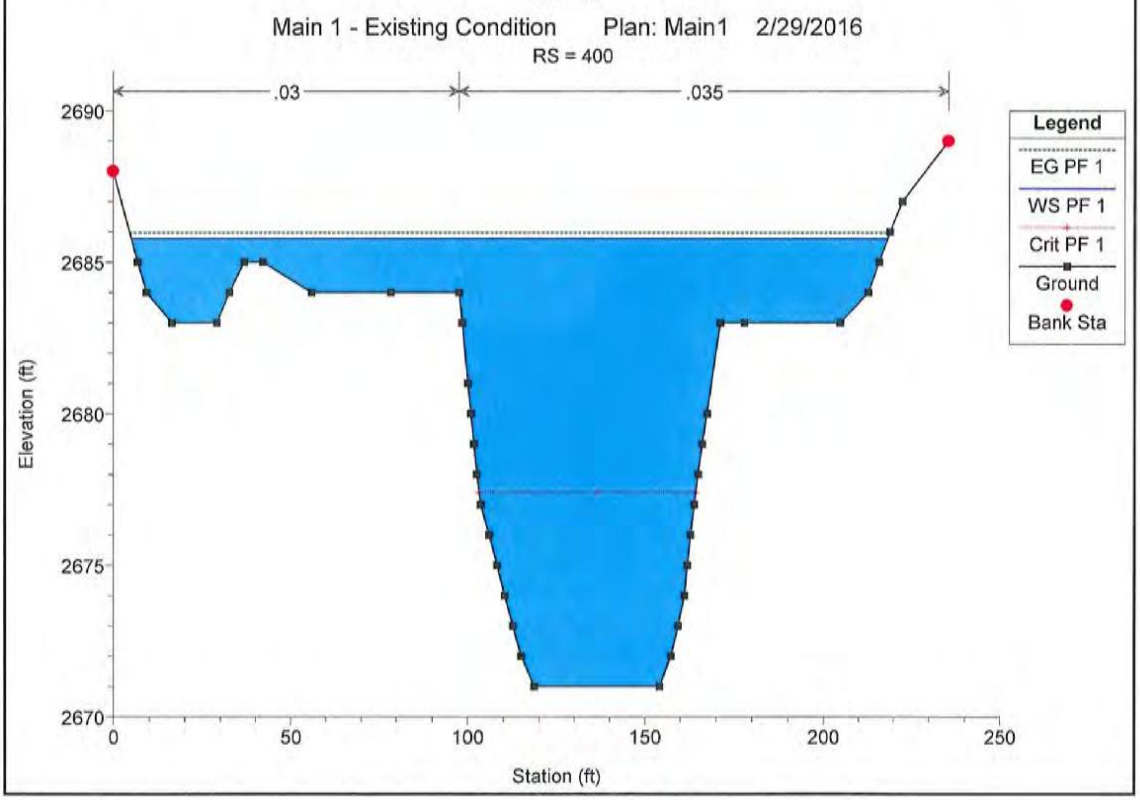

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 900
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

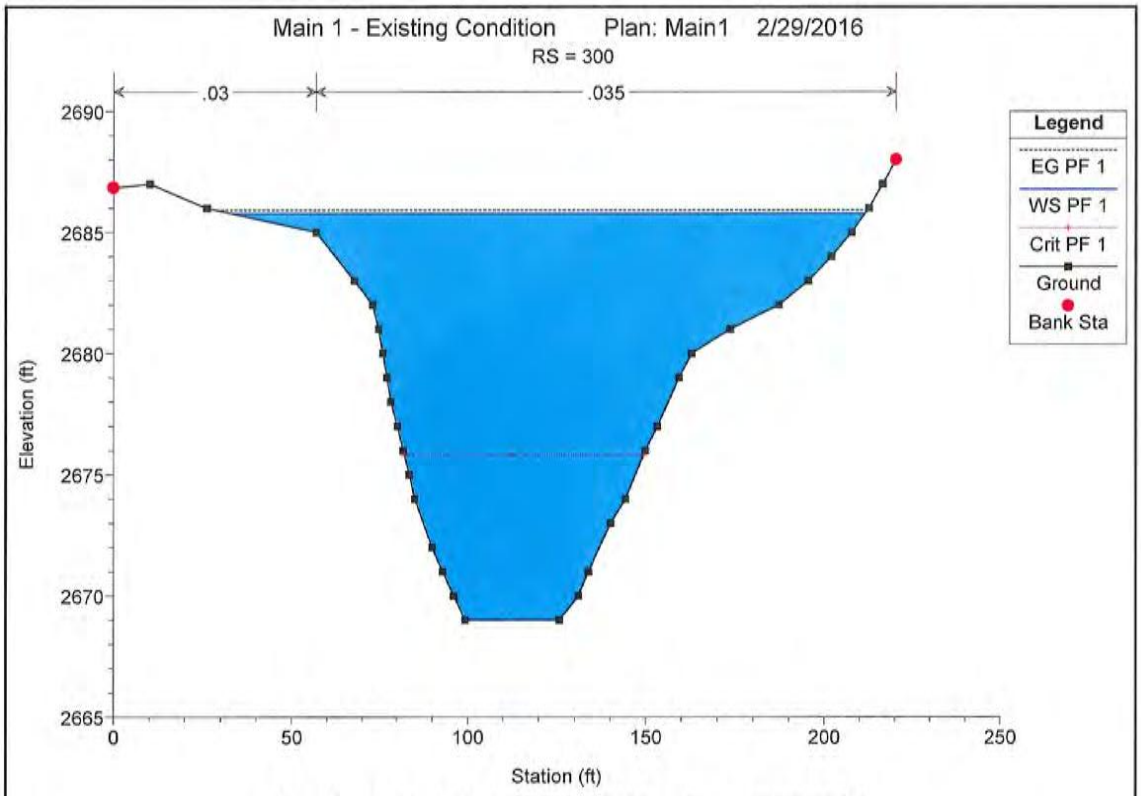

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 800
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

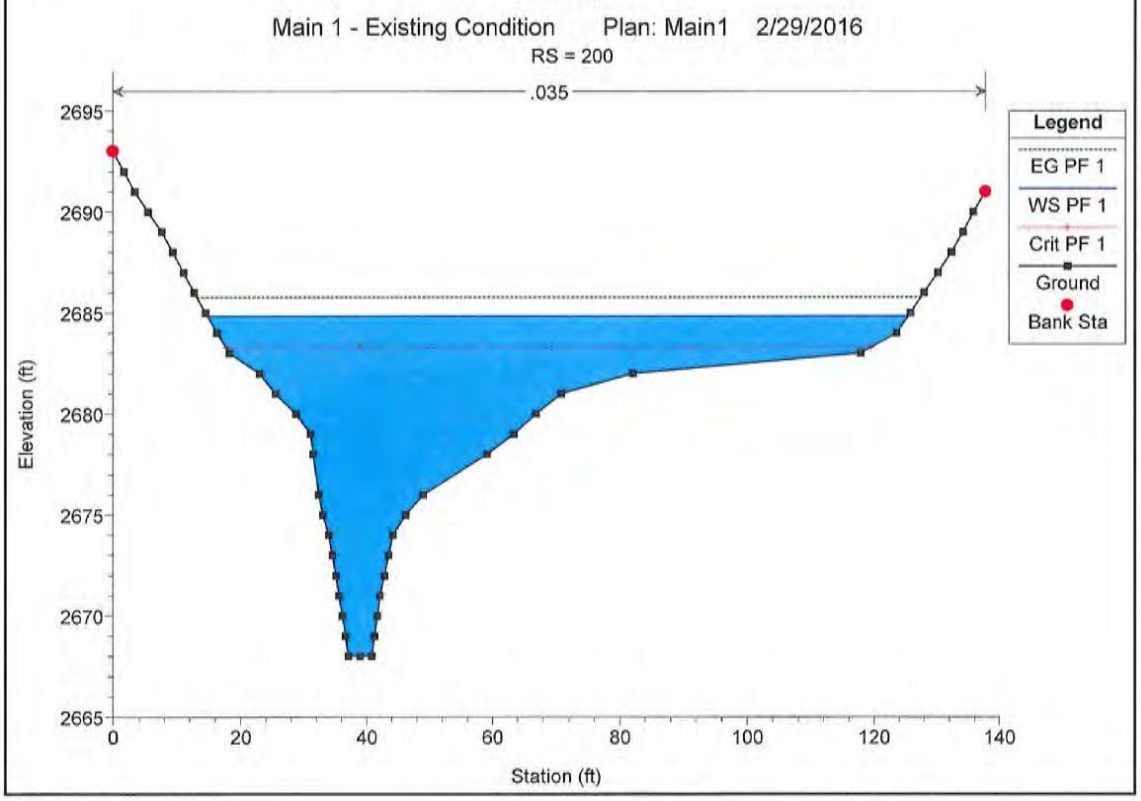

Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 700
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 600
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 500
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2690
2685
2680
2675
2670
0
50
100
150
200
Station (ft)


Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 400
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2690
2685
2680
2675
2670
0
50
100
150
200
250
Station (ft)


Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 300
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2690
2685
2680
2675
2670
2665
0
50
100
150
200
250


Main 1 - Existing Condition Plan: Main1 2/29/2016
RS = 200
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2695
2690
2685
2680
2675
2670
2665
0
20
40
60
80
100
120
140

HEC-RAS ANALYSIS

EXISTING CONDITIONS MAIN 2

```
                    HEC-RAS Version 4.1.0 Jan 2010
                     U.S. Army Corps of Engineers
                    Hydrologic Engineering Center
                         609 Second Street
                         Davis, California

          X     X  XXXXXX    XXXX        XXXX        XX       XXXX
          X     X  X        X    X       X   X      X  X     X
          X     X  X        X            X   X     X    X    X
          XXXXXXX  XXXX     X       XXX  XXXX      XXXXXX     XXXX
          X     X  X        X            X  X      X    X        X
          X     X  X        X    X       X   X     X    X        X
          X     X  XXXXXX    XXXX        X    X    X    X    XXXXX


PROJECT DATA
Project Title: Main 2 - Existing Condition
Project File : EXISTINGSOUTHWASH.prj
Run Date and Time: 2/29/2016 11:00:05 AM

Project in English units


PLAN DATA

Plan Title: Main2 Existing
Plan File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Main2\EXISTINGSOUTHWASH.P01

          Geometry Title: Main2 Existing
          Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-
Main2\EXISTINGSOUTHWASH.G01

          Flow Title     : Main2 Existing
          Flow File      : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-
Main2\EXISTINGSOUTHWASH.F01

Plan Summary Information:
Number of:  Cross Sections =    6    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed at all cross sections
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Mixed Flow


FLOW DATA

Flow Title: Main2 Existing
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Main2\EXISTINGSOUTHWASH.F01

Flow Data (cfs)

  River           Reach           RS                  PF 1
  Unnamed Lateral Lateral 1       5400                1912
```

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed Lateral	Lateral 1	PF 1	Critical	Normal S = 0.011

GEOMETRY DATA

Geometry Title: Main2 Existing
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Main2\EXISTINGSOUTHWASH.G01

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5400

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2787	2.95	2786	6.53	2785	38.23	2784	42.43	2784
54.94	2785	58.99	2786	63.69	2787	68.44	2788	75.94	2788
80.04	2787	83.41	2786	87.97	2785	100.26	2785	104.72	2786
134.14	2786	154.63	2786	158.25	2786	164.28	2785	169.88	2784
175.32	2783	181.95	2783	193.11	2783	197.84	2784	204.19	2784
237.35	2781	254.68	2780	258.39	2780	275	2780.8	293.68	2780.8
293.68	2787								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	54.94	.03	237.35	.035	293.68	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	293.68	211	96	93.25	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
169.88	197.84	2784	169.88	197.84	2782

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5300

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2783	5.22	2782	10.85	2781	52.66	2781	56.83	2782
60.59	2783	64.22	2784	67.89	2785	71.65	2786	75.71	2787
79.72	2788	83.93	2789	89.08	2790	94.88	2791	108.85	2790
117.91	2789	120.88	2789	131.44	2789	136.09	2788	140.07	2787
143.78	2786	147.88	2785	154.19	2784	198.1	2782	205.69	2781
212	2780	213.74	2779	230.55	2778	231.24	2778	246.2	2779
267.09	2779	267.09	2785						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	56.83	.03	212	.035	267.09	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	267.09	181.6	103	49.77	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	60.59	2783	0	60.59	2780

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5200

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2778	6.35	2777	64.02	2777	65.52	2778	78.35	2779
102.26	2779	110.95	2777	112.68	2776	118.85	2775	119.4	2774
119.81	2773	120.22	2772	120.68	2771	121.1	2770	121.53	2769
121.99	2768	123.78	2767	127.96	2766	152.34	2765	160.08	2764
171.08	2764	171.58	2765	172.09	2766	172.47	2767	172.89	2768
173.22	2769	173.57	2770	174.17	2772	174.49	2773	174.77	2774
175.81	2775	186.5	2776	209.86	2777	217.39	2777	238.13	2777
246.61	2777								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	78.35	.03	102.26	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	246.61	101.72	101.18	99.54	.1	.3

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5100

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2778.55	6.02	2776	7.94	2775	9.49	2774	23.17	2774
71.71	2775	74.37	2775	93.06	2774	109.68	2773	110.14	2772
110.57	2771	110.99	2770	111.35	2769	114.85	2768	119.16	2767
123.19	2766	126.75	2765	130.16	2764	134.46	2762	136.12	2761
140.9	2760	144.37	2760	148.44	2761	150.35	2761	154.69	2760
161.59	2759	164.24	2759	169.63	2760	173.1	2761	175.15	2762
176.7	2763	199.05	2764	199.21	2765	199.37	2766	199.53	2767
199.62	2768	199.79	2769	199.92	2770	200.06	2771	200.4	2772
205.81	2773	212.2	2774	215.84	2775	241.01	2775	245.76	2774
263.63	2774	263.63	2780						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	215.84	.03	241.01	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	263.63	49.87	50.66	49.68	.1	.3

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5000

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2776	.2	2776	2.69	2775	4.37	2774	10.52	2773
12.97	2773	63.61	2773	107.83	2773	128.27	2772	131.15	2771
131.75	2770	132.33	2769	132.94	2768	133.52	2767	134.1	2766

134.69	2765	135.28	2764	135.86	2763	136.47	2762	137.01	2761
137.58	2760	139.32	2759	141.34	2758	156.37	2758	161.79	2759
169.28	2760	173.97	2761	194.87	2762	206.23	2762	208.36	2765
208.68	2766	209.01	2767	209.33	2768	209.62	2769	210.13	2771
217.27	2772	267.37	2773	267.37	2776				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	267.37	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	267.37	99.31	100.71	99.87	.1	.3

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 4900

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2771	22.9	2771	44.41	2770	56.5	2770	80.02	2770
110.42	2769	112.53	2768	112.7	2767	112.95	2766	113.16	2765
113.62	2764	117.02	2763	118.49	2762	119.53	2761	120.36	2760
121.19	2759	122.01	2758	122.82	2757	124.21	2756	141.49	2756
146.47	2757	149.64	2758	159.38	2759	174.05	2759	183.11	2759
183.46	2760	183.75	2761	184.03	2762	184.31	2763	184.65	2764
184.94	2765	185.27	2766	185.58	2767	185.84	2768	190.13	2769
226.92	2770	236.19	2771						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	236.19	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	236.19	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Unnamed Lateral

Reach	River Sta.	n1	n2	n3	n4
Lateral 1	5400	.035	.03	.035	.035
Lateral 1	5300	.035	.03	.035	.035
Lateral 1	5200	.035	.03	.035	
Lateral 1	5100	.035	.03	.035	
Lateral 1	5000	.035	.035	.035	
Lateral 1	4900	.035	.035	.035	

SUMMARY OF REACH LENGTHS

River: Unnamed Lateral

Reach	River Sta.	Left	Channel	Right
Lateral 1	5400	211	96	93.25
Lateral 1	5300	181.6	103	49.77
Lateral 1	5200	101.72	101.18	99.54
Lateral 1	5100	49.87	50.66	49.68
Lateral 1	5000	99.31	100.71	99.87
Lateral 1	4900			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Unnamed Lateral

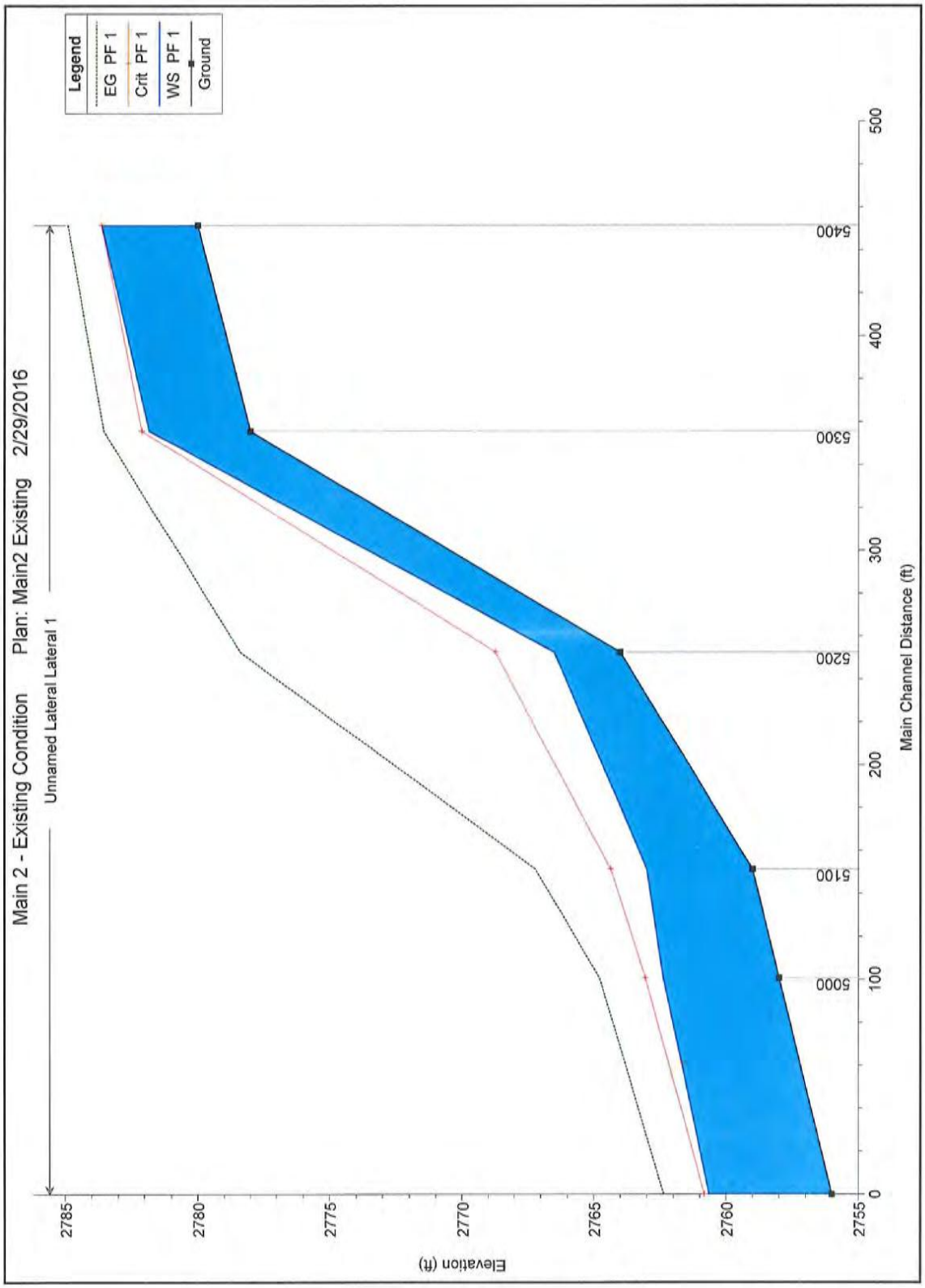
Reach	River Sta.	Contr.	Expan.
Lateral 1	5400	.1	.3
Lateral 1	5300	.1	.3
Lateral 1	5200	.1	.3
Lateral 1	5100	.1	.3
Lateral 1	5000	.1	.3
Lateral 1	4900	.1	.3

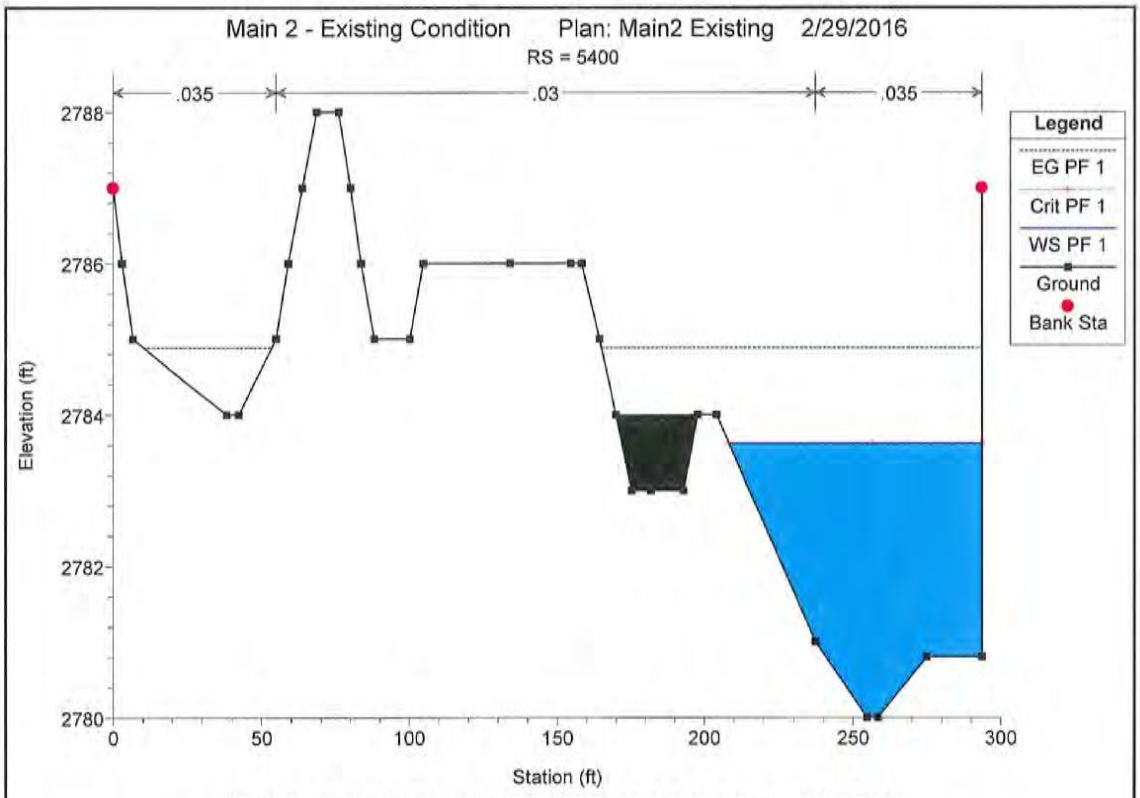
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : 2

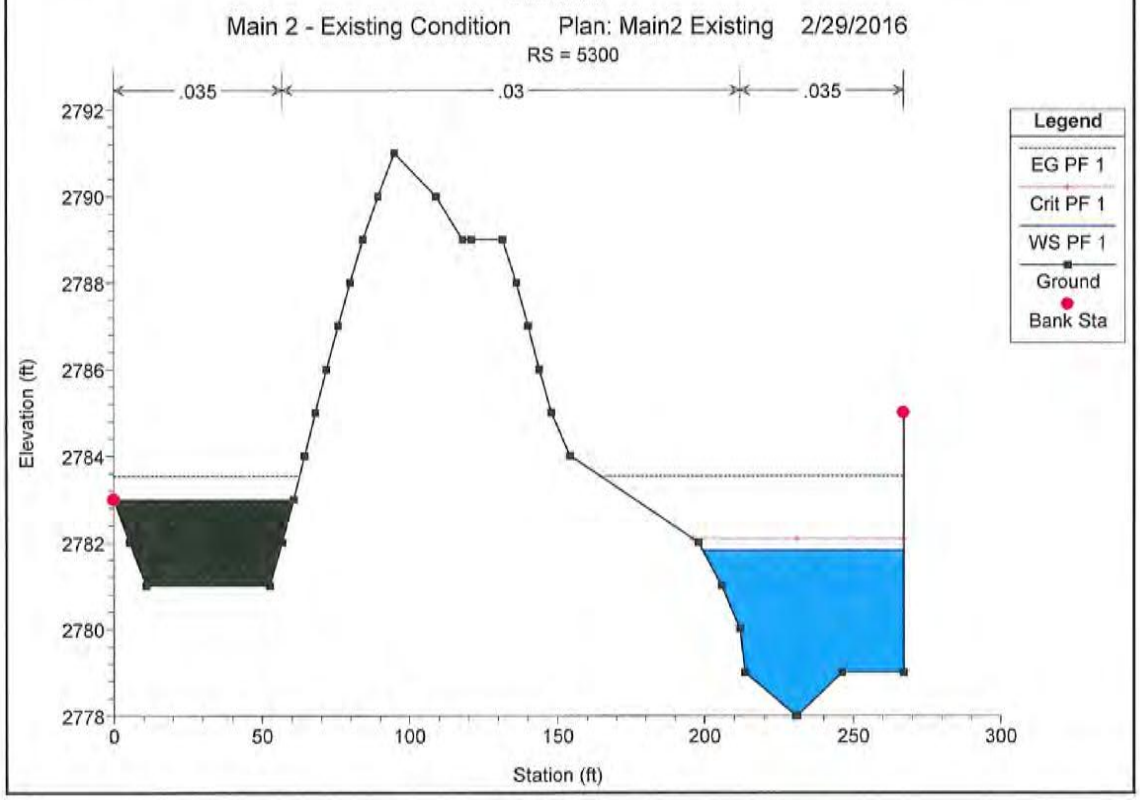
River: Unnamed Lateral Reach: Lateral 1 RS: 5400 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Lateral Reach: Lateral 1 RS: 5300 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Unnamed Lateral Reach: Lateral 1 RS: 5200 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Unnamed Lateral Reach: Lateral 1 RS: 5100 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Unnamed Lateral Reach: Lateral 1 RS: 5000 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Unnamed Lateral Reach: Lateral 1 RS: 4900 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

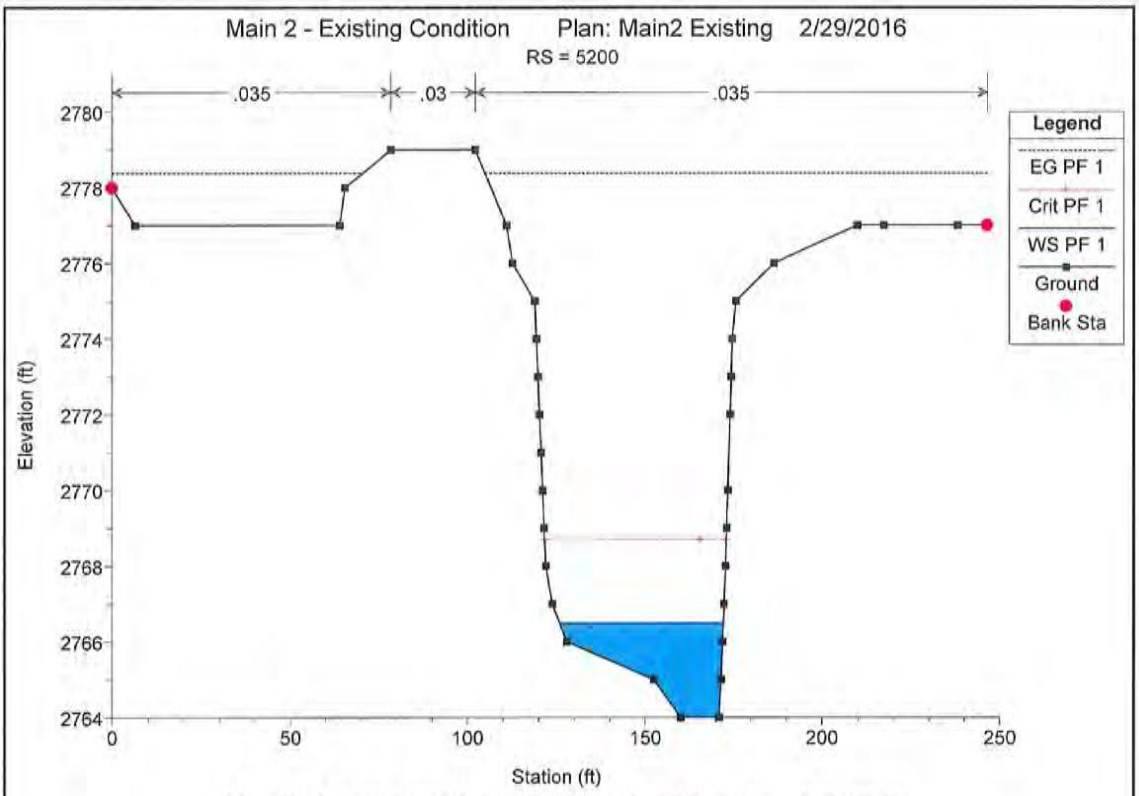
HEC-RAS Plan: 2 River: Unnamed Lateral Reach: Lateral 1 Profile: PF 1

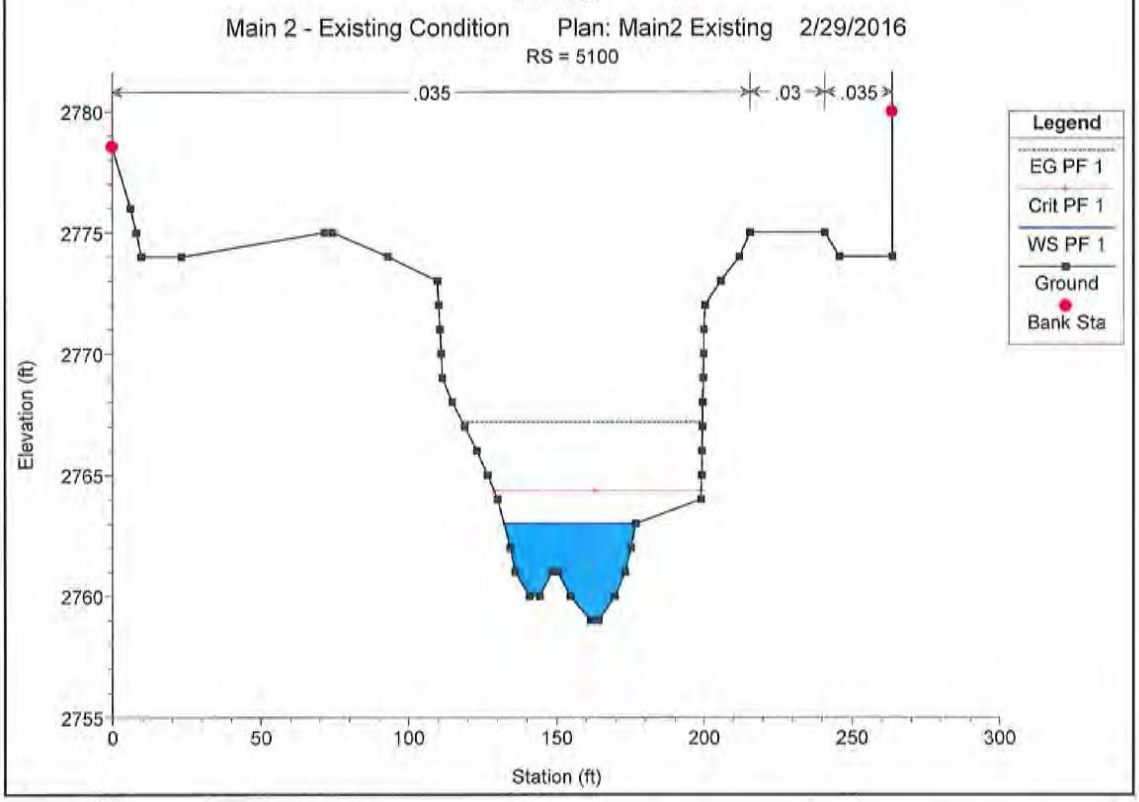
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lateral 1	5400	PF 1	1912.00	2780.00	2783.62	2783.63	2784.89	0.012091	9.02	211.90	85.33	1.01
Lateral 1	5300	PF 1	1912.00	2778.00	2781.81	2782.08	2783.54	0.015582	10.54	181.43	67.57	1.13
Lateral 1	5200	PF 1	1912.00	2764.00	2766.49	2768.70	2778.38	0.261843	27.67	69.11	46.38	3.99
Lateral 1	5100	PF 1	1912.00	2759.00	2762.99	2764.36	2767.18	0.043559	16.44	116.28	44.34	1.79
Lateral 1	5000	PF 1	1912.00	2758.00	2762.37	2763.03	2764.77	0.031622	12.44	153.65	70.25	1.48
Lateral 1	4900	PF 1	1912.00	2756.00	2760.64	2760.82	2762.35	0.016226	10.50	182.15	63.82	1.09

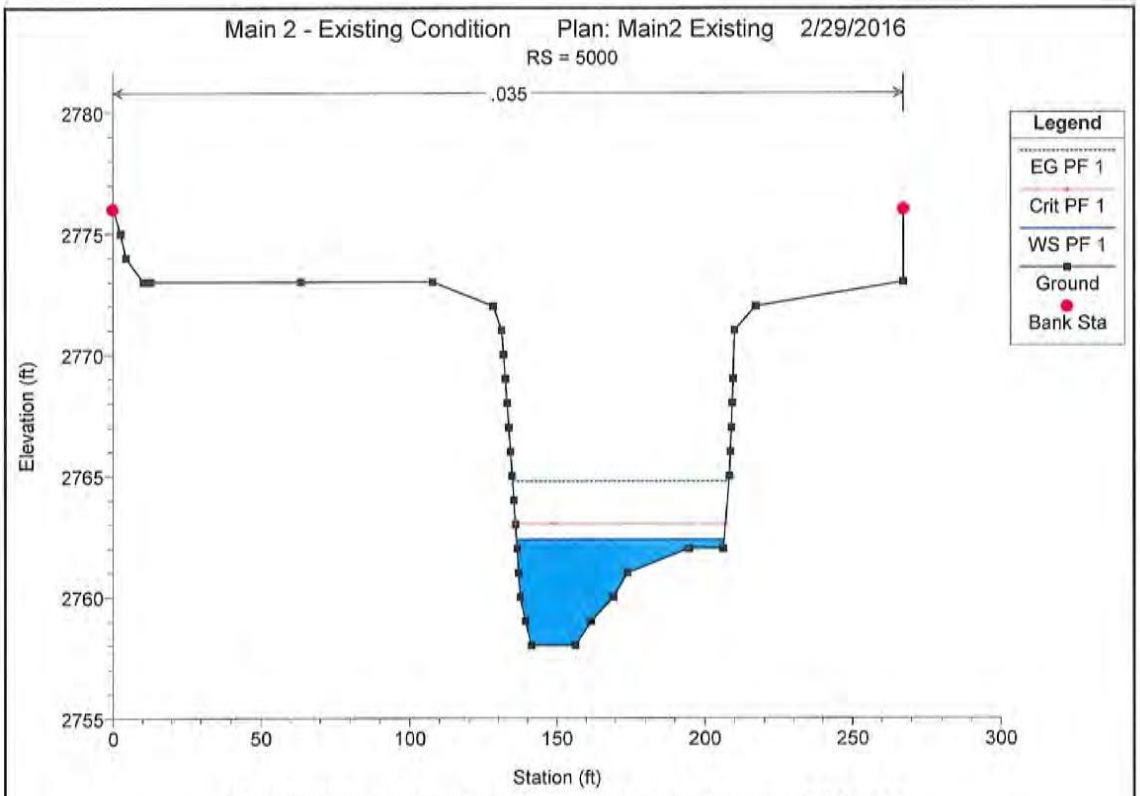

Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
Unnamed Lateral Lateral 1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2785
2780
2775
2770
2765
2760
2755
0
100
200
300
400
500
Main Channel Distance (ft)
5000
5100
5200
5300
5400

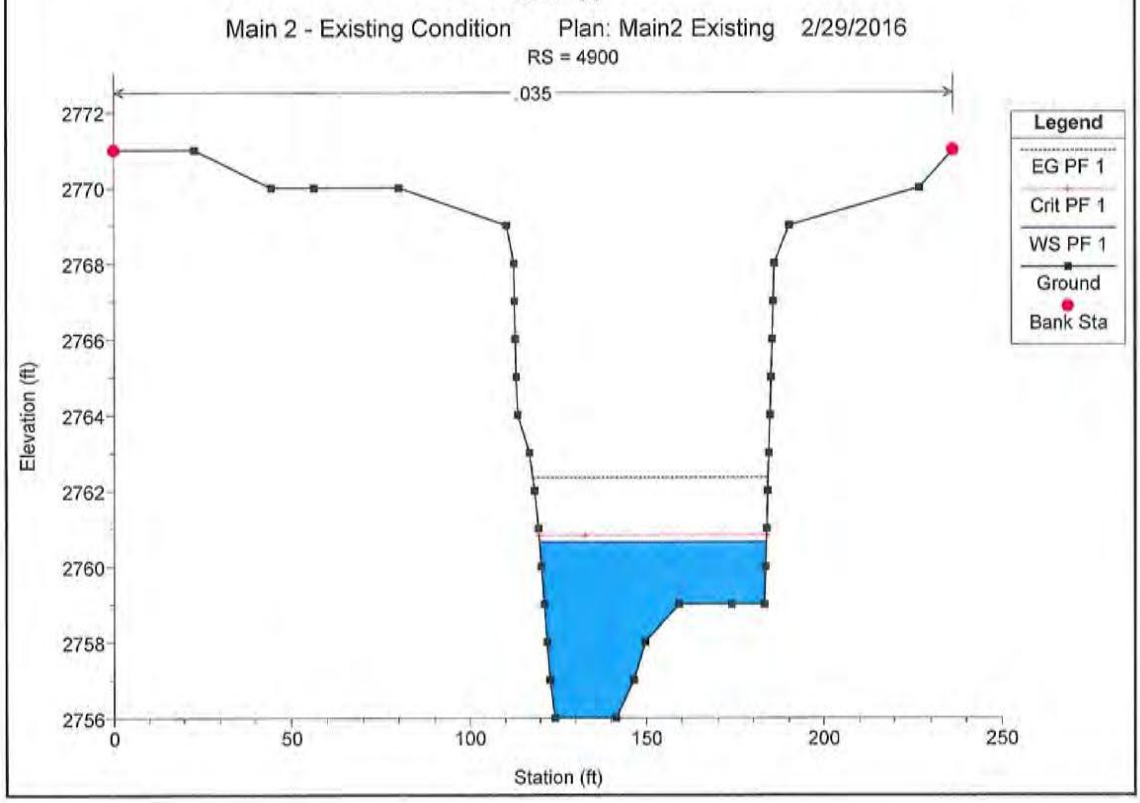

Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
RS = 5400
.035
.03
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
RS = 5300
.035
.03
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
RS = 5200
.035
.03
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
RS = 5100
.035
.03
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
RS = 5000
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Existing Condition Plan: Main2 Existing 2/29/2016
RS = 4900
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS ANALYSIS

PROPOSED CONDITIONS MAIN 1

```
HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Main 1 - Proposed Condition
Project File : PROP3.prj
Run Date and Time: 3/2/2016 4:20:31 PM

Project in English units

PLAN DATA

Plan Title: Current model
Plan File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\PROP3.P01

Geometry Title: Main 1 Proposed
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\PROP3.G01

Flow Title : 0 Flow Profiles
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\PROP3.F01

Plan Summary Information:

Number of:	Cross Sections =	4	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculation tolerance	=	0.01
Maximum number of iterations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 0 Flow Profiles
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\PROP3.F01

Flow Data (cfs)

River	Reach	RS	PF 1
Unnamed Wash	Main1-Prop	2700	2128

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed Wash	Main1-Prop	PF 1	Critical	Known WS = 2752.49

GEOMETRY DATA

Geometry Title: Main 1 Proposed
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\01-Main1\PROP3.G01

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1-Prop RS: 2700

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2769	4.32	2768	8.89	2767	14.12	2766	19.18	2765
24.32	2764	29.44	2763	34.62	2762	39.85	2761	45	2760
48.3	2759	51.08	2758	54.15	2757	58.29	2756	74.22	2756
77.45	2757	80.08	2758	90.95	2758	94.1	2757	95.07	2757
97.37	2758	99.58	2759	100.37	2760	101.18	2761	101.97	2762
103.09	2763	105.64	2764	108.63	2765	112.52	2766	116.09	2767
119.56	2768	127.49	2769						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	127.49	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	127.49	95.75	98.69	107.97	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1-Prop RS: 2600

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2765	3.19	2764	6.31	2763	9.41	2762	12.03	2761
12.88	2760	13.83	2759	14.76	2758	15.74	2757	16.76	2756
17.69	2755	18.58	2754	22.83	2752	32.12	2752	37.82	2754
43.67	2755	52.8	2756	66.54	2757	66.62	2758	66.71	2759
68.82	2761	68.85	2761	70.78	2759	71.78	2758	72.75	2757
86.93	2757	90.38	2758	91.7	2759	92.96	2760	94.15	2761
99.48	2762	104.49	2763	110.14	2764	115.64	2765		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	115.64	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	115.64	101.86	103.65	108.71	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1-Prop RS: 2500

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2761	.38	2760	.75	2759	1.17	2758	1.89	2756
2.3	2755	2.68	2754	3.06	2753	3.44	2752	9.58	2748
17.77	2748	34.89	2752	60.1	2753	67.24	2754	71.71	2755
76.74	2756	84.67	2758	93.68	2759	99.64	2760	104.45	2761

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	104.45	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	104.45	108.74	100.43	96.31	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1-Prop RS: 2400

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2758	33	2739.36	55	2739.36	74	2749	90.83	2749
95.4	2751	98.61	2752	104.46	2754	109.02	2755	118.84	2756
121.79	2757	123.77	2758	126.1	2759	128.13	2759		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	128.13	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	128.13	.3	.5

SUMMARY OF MANNING'S N VALUES

River:Unnamed Wash

Reach	River Sta.	n1	n2	n3
Main1-Prop	2700	.035	.035	.035
Main1-Prop	2600	.035	.035	.035
Main1-Prop	2500	.035	.035	.035
Main1-Prop	2400	.035	.035	.035

SUMMARY OF REACH LENGTHS

River: Unnamed Wash

Reach	River Sta.	Left	Channel	Right
Main1-Prop	2700	95.75	98.69	107.97
Main1-Prop	2600	101.86	103.65	108.71
Main1-Prop	2500	108.74	100.43	96.31
Main1-Prop	2400			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Unnamed Wash

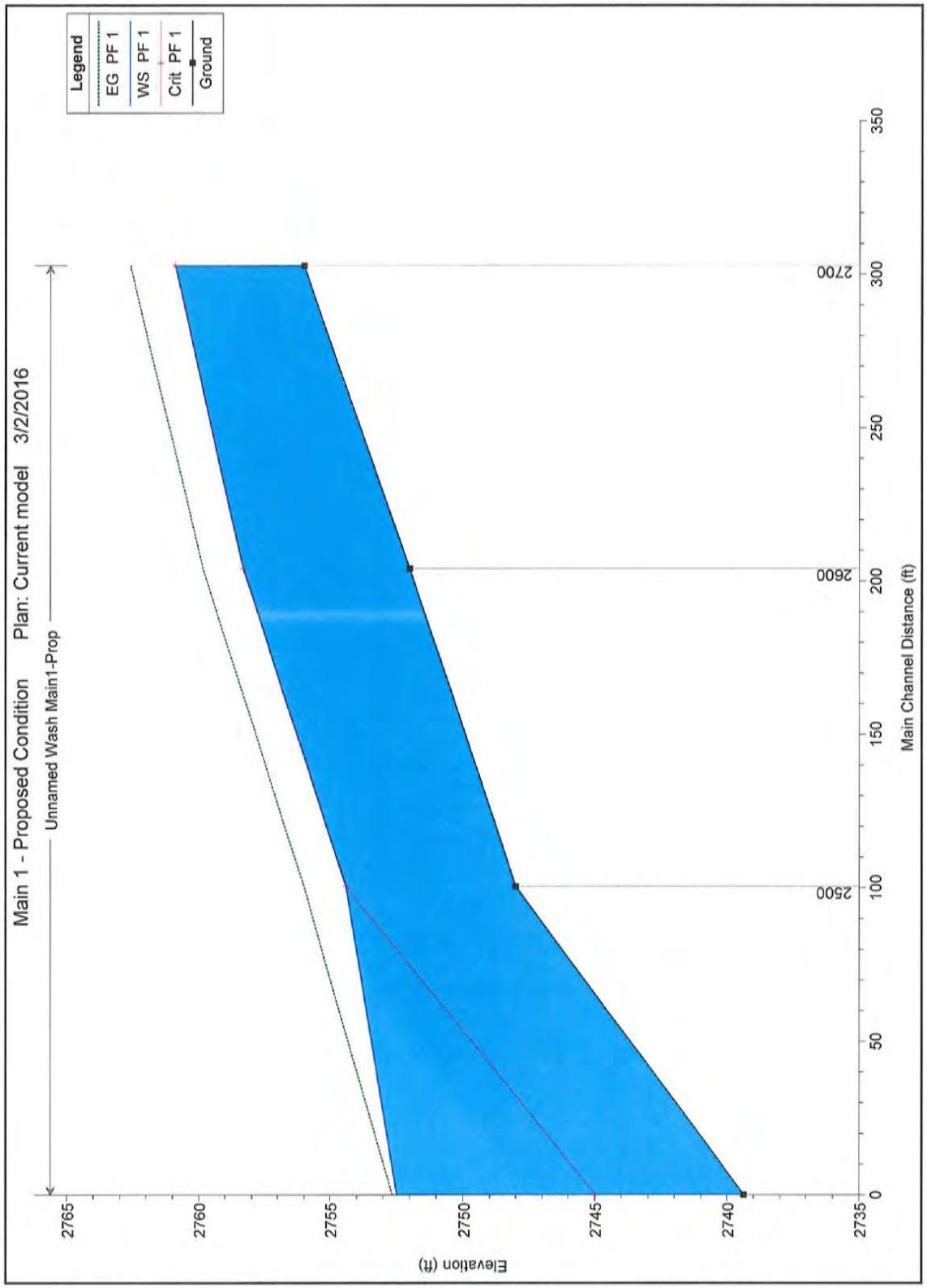
Reach	River Sta.	Contr.	Expan.
Main1-Prop	2700	.1	.3
Main1-Prop	2600	.1	.3
Main1-Prop	2500	.1	.3
Main1-Prop	2400	.3	.5

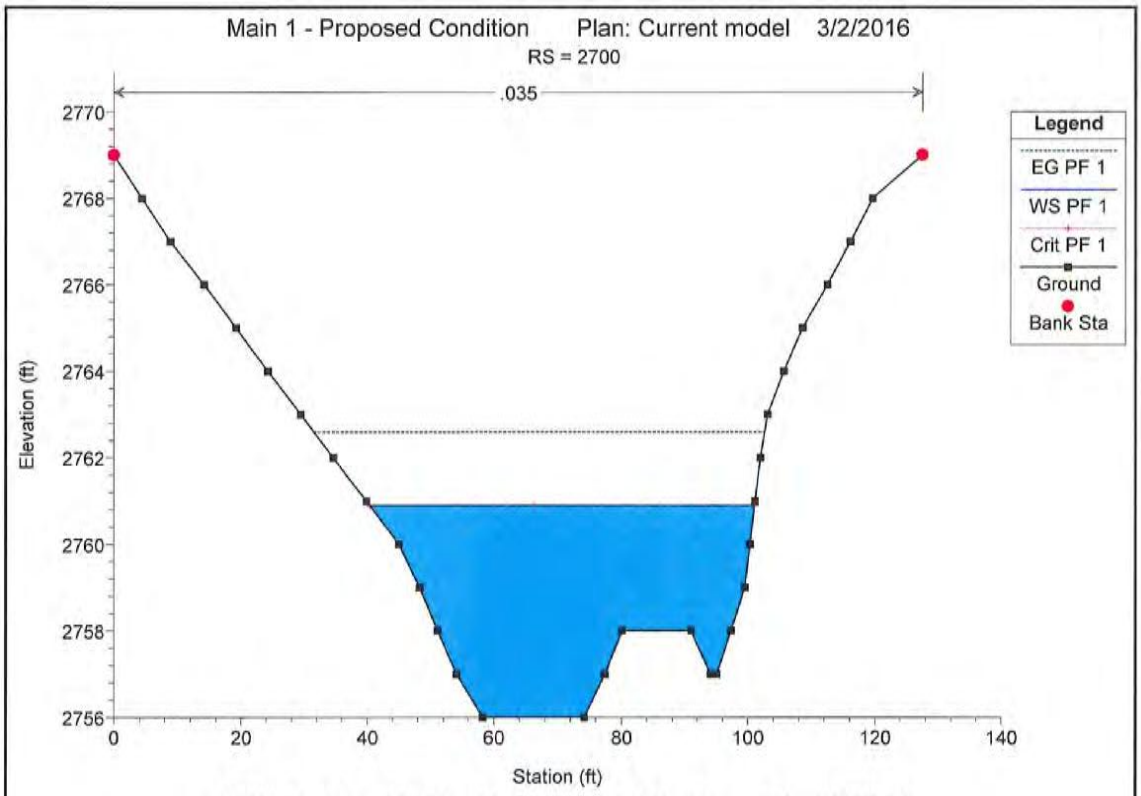
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Current mode

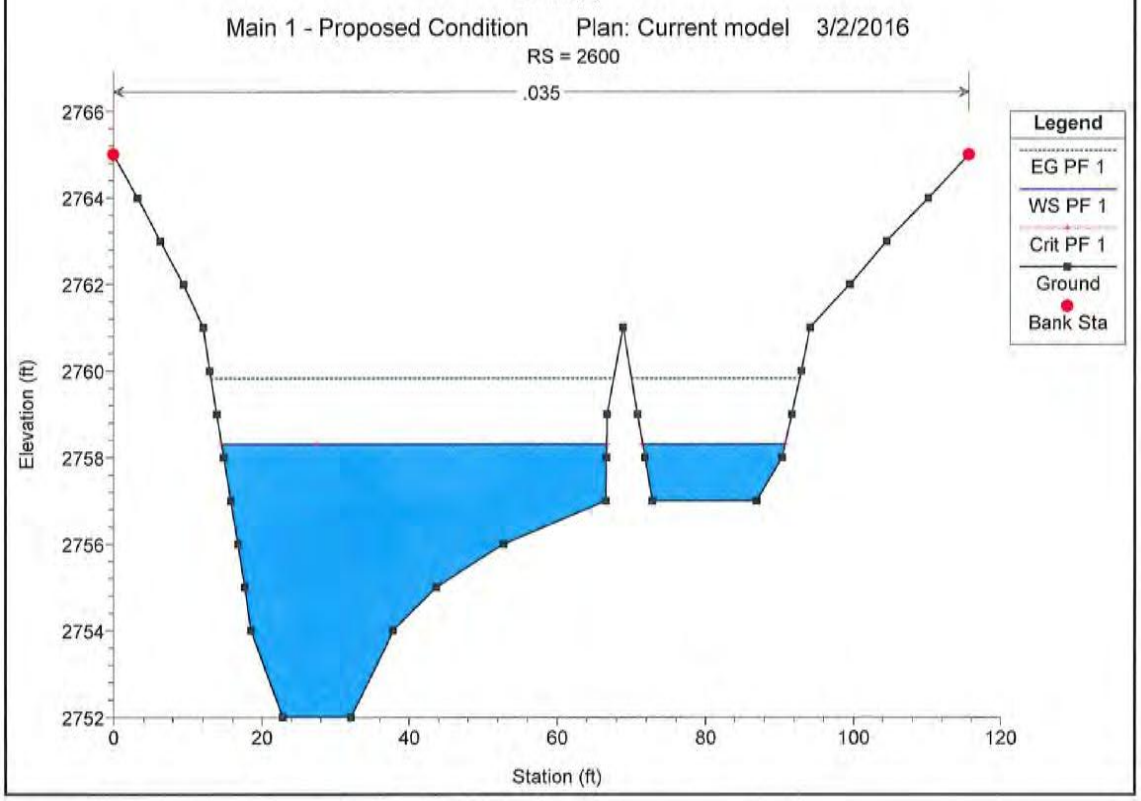
River: Unnamed Wash Reach: Main1-Prop RS: 2700 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1-Prop RS: 2600 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1-Prop RS: 2500 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

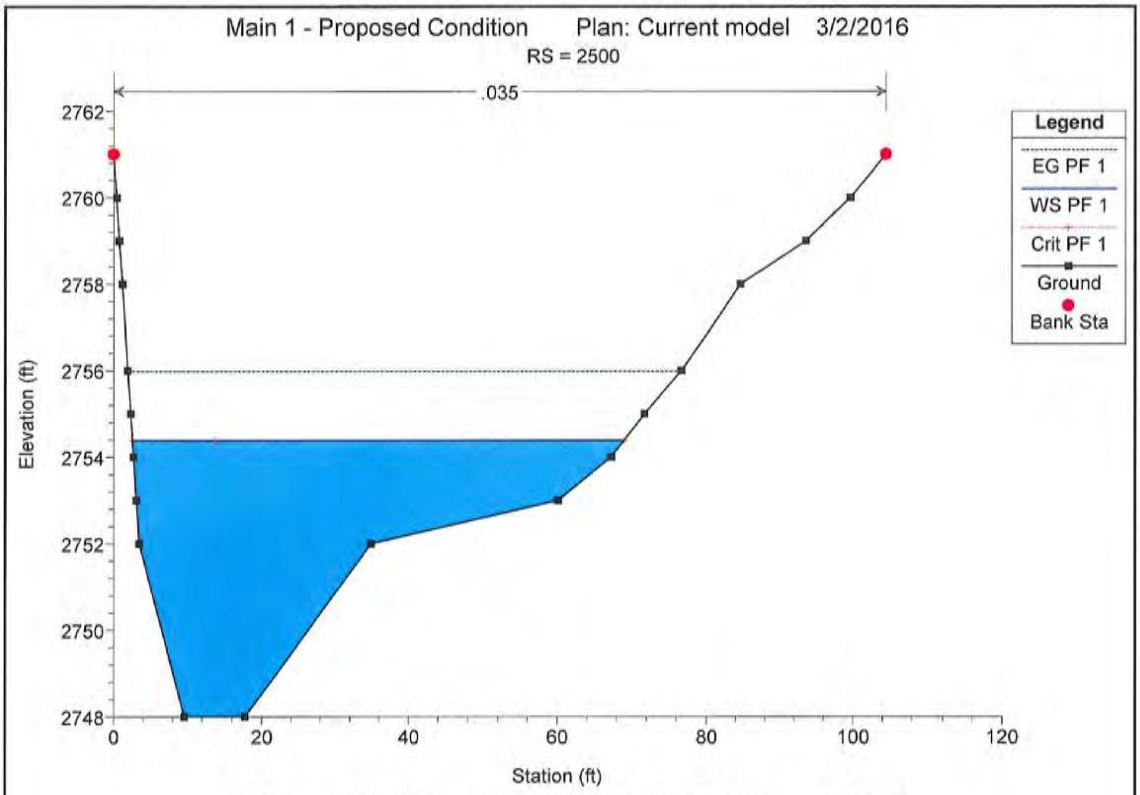
HEC-RAS Plan: Current mode River: Unnamed Wash Reach: Main1-Prop Profile: PF 1

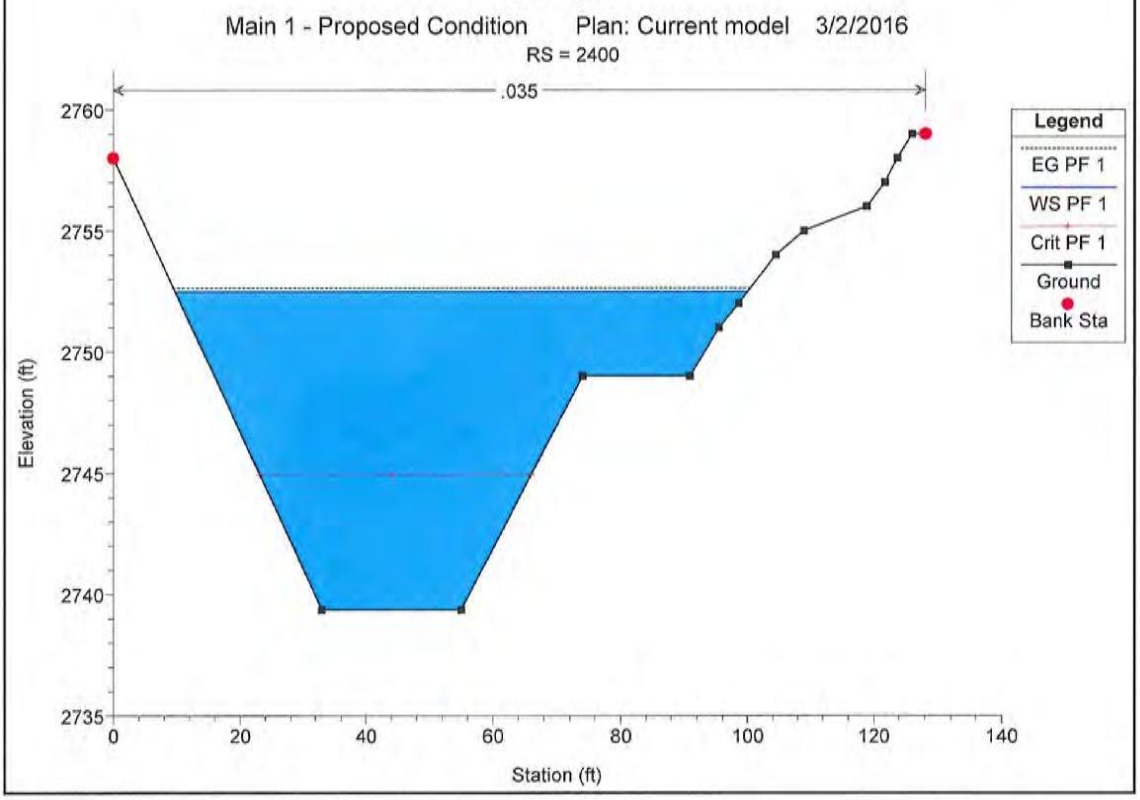
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main1-Prop	2700	PF 1	2128.00	2756.00	2760.90	2760.90	2762.59	0.012742	10.45	203.62	60.71	1.01
Main1-Prop	2600	PF 1	2128.00	2752.00	2758.31	2758.31	2759.83	0.013626	9.89	215.14	71.49	1.00
Main1-Prop	2500	PF 1	2128.00	2748.00	2754.39	2754.39	2755.99	0.013172	10.14	209.83	66.45	1.01
Main1-Prop	2400	PF 1	2128.00	2739.36	2752.49	2744.95	2752.65	0.000417	3.16	672.99	90.29	0.20


Main 1 - Proposed Condition Plan: Current model 3/2/2016
Unnamed Wash Main1-Prop
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
2500
2600
2700
Elevation (ft)
2765
2760
2755
2750
2745
2740
2735
Main Channel Distance (ft)
0
50
100
150
200
250
300
350


Main 1 - Proposed Condition Plan: Current model 3/2/2016
RS = 2700
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Proposed Condition Plan: Current model 3/2/2016
RS = 2600
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Proposed Condition Plan: Current model 3/2/2016
RS = 2500
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Proposed Condition Plan: Current model 3/2/2016
RS = 2400
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS ANALYSIS

PROPOSED CONDITIONS MAIN 2

```
                    HEC-RAS Version 4.1.0 Jan 2010
                     U.S. Army Corps of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X        X
          X     X  X        X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX


PROJECT DATA
Project Title: Main 2 - Proposed Condition
Project File : PROPOSEDSOUTHWASH.prj
Run Date and Time: 3/3/2016 9:32:32 AM

Project in English units


PLAN DATA

Plan Title: Main 2
Plan File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Main2\PROPOSEDSOUTHWASH.P01

           Geometry Title: Main 2
           Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-
Main2\PROPOSEDSOUTHWASH.G01

           Flow Title    : Main 2
           Flow File     : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-
Main2\PROPOSEDSOUTHWASH.F01

Plan Summary Information:
Number of:  Cross Sections =    5    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed at all cross sections
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Mixed Flow


FLOW DATA

Flow Title: Main 2
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Main2\PROPOSEDSOUTHWASH.F01

Flow Data (cfs)

  River           Reach           RS                  PF 1
  Unnamed Lateral Lateral 1       5400                1910
```

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed Lateral	Lateral 1	PF 1	Critical	Known WS = 2771.09

GEOMETRY DATA

Geometry Title: Main 2
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Main2\PROPOSEDSOUTHWASH.G01

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5400

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2787	2.95	2786	6.53	2785	38.23	2784	42.43	2784
54.94	2785	58.99	2786	63.69	2787	68.44	2788	75.94	2788
80.04	2787	83.41	2786	87.97	2785	100.26	2785	104.72	2786
134.14	2786	154.63	2786	158.25	2786	164.28	2785	169.88	2784
175.32	2783	181.95	2783	193.11	2783	197.84	2784	204.19	2784
237.35	2781	254.68	2780	258.39	2780	275	2780.8	293.68	2780.8
293.68	2787								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	54.94	.03	237.35	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	293.68	211	96	93.25	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
169.88	197.84	2784	169.88	197.84	2782

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5300

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2783	5.22	2782	10.85	2781	52.66	2781	56.83	2782
60.59	2783	64.22	2784	67.89	2785	71.65	2786	75.71	2787
79.72	2788	83.93	2789	89.08	2790	94.88	2791	108.85	2790
117.91	2789	120.88	2789	131.44	2789	136.09	2788	140.07	2787
143.78	2786	147.88	2785	154.19	2784	198.1	2782	205.69	2781
212	2780	213.74	2779	230.55	2778	231.24	2778	246.2	2779
267.09	2779	267.09	2785						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	56.83	.03	212	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	267.09	181.6	103	49.77	.1	.3

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
0	60.71	2783	0	60.71	2780

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5200

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2778	.01	2778	6.64	2777	64.28	2777	65.78	2778
78.35	2779	102.26	2779	109.54	2778	111.21	2777	112.94	2776
121.87	2774	126.21	2773	140.34	2772	167.67	2772	170.61	2773
173.68	2774	176.47	2775	179.06	2776	189.98	2777	210.1	2777
217.68	2777	237.76	2777	243.02	2777	246.61	2777	246.61	2780

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	65.78	.03	109.54	.035	112.94	.04	179.06	.035
246.61	.035								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	246.61	101.72	101.18	99.54	.1	.3

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5100

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2778.55	5.55	2776	7.72	2775	28.24	2774	43.78	2773
56.32	2772	71.95	2771	86.42	2770	96.57	2769	104.89	2768
117.08	2767	128.49	2766	139.73	2765	153.97	2764	179.84	2764
183.7	2765	186.61	2766	189.33	2767	191.36	2768	194.16	2769
197.58	2770	200.46	2771	203	2772	206.01	2773	211.83	2774
215.87	2775	241.04	2775	245.71	2774	257.55	2774	263.63	2774
263.63	2780								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	56.32	.04	203	.035	263.63	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	263.63	49.87	50.66	49.68	.1	.3

CROSS SECTION

RIVER: Unnamed Lateral
REACH: Lateral 1 RS: 5000

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2776	1.02	2776	3.79	2775	32.75	2774	53.22	2773
70.53	2772	92.22	2771	110.68	2770	116.83	2769	121.85	2768
127.31	2767	130.63	2766	133.74	2765	136.6	2764	143.25	2763
149.02	2762	153.27	2761	157.12	2759.39	177.14	2759.39	181.95	2761
185.81	2762	191.56	2763	195.69	2764	199.22	2765	202.35	2766
205.46	2767	208.48	2768	211.28	2769	214.18	2770	217.33	2771
223.48	2772	267.37	2772	267.37	2776				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	70.53	.04	223.48	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	267.37	.3	.5

SUMMARY OF MANNING'S N VALUES

River:Unnamed Lateral

Reach	River Sta.	n1	n2	n3	n4	n5	n6
Lateral 1	5400	.035	.03	.035			
Lateral 1	5300	.035	.03	.035			
Lateral 1	5200	.035	.03	.035	.04	.035	.035
Lateral 1	5100	.035	.04	.035	.035		
Lateral 1	5000	.035	.04	.035			

SUMMARY OF REACH LENGTHS

River: Unnamed Lateral

Reach	River Sta.	Left	Channel	Right
Lateral 1	5400	211	96	93.25
Lateral 1	5300	181.6	103	49.77
Lateral 1	5200	101.72	101.18	99.54
Lateral 1	5100	49.87	50.66	49.68
Lateral 1	5000			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Unnamed Lateral

Reach	River Sta.	Contr.	Expan.
Lateral 1	5400	.1	.3
Lateral 1	5300	.1	.3
Lateral 1	5200	.1	.3
Lateral 1	5100	.1	.3
Lateral 1	5000	.3	.5

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Current mode

River: Unnamed Lateral Reach: Lateral 1 RS: 5300 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Unnamed Lateral Reach: Lateral 1 RS: 5200 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.

River: Unnamed Lateral Reach: Lateral 1 RS: 5100 Profile: PF 1

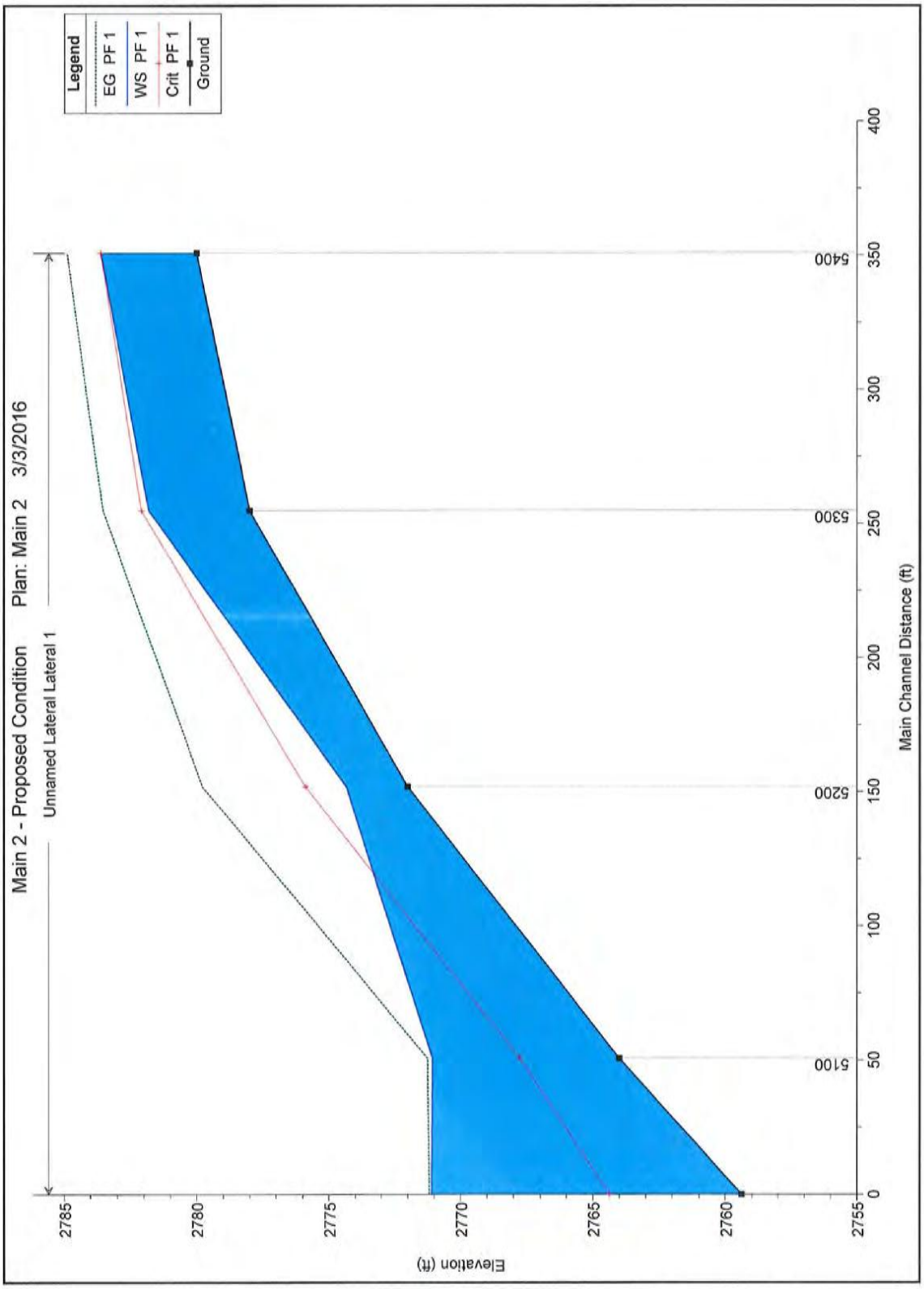
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

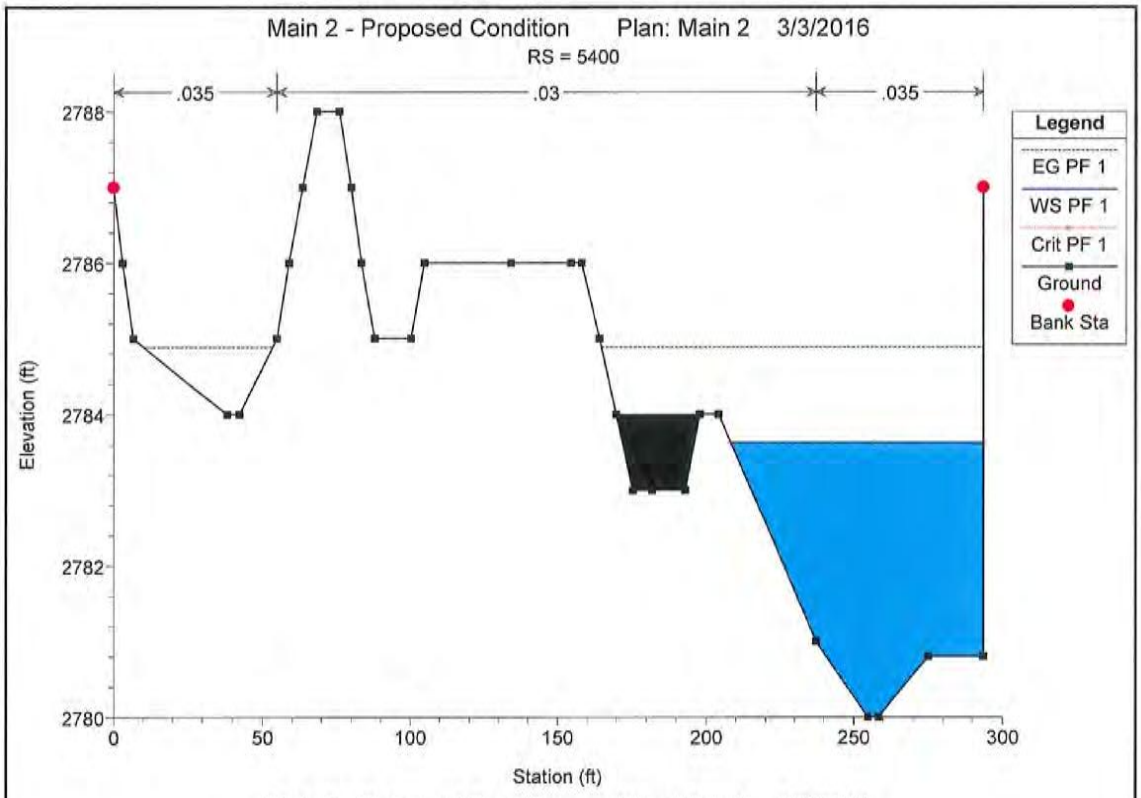
This may indicate the need for additional cross sections.

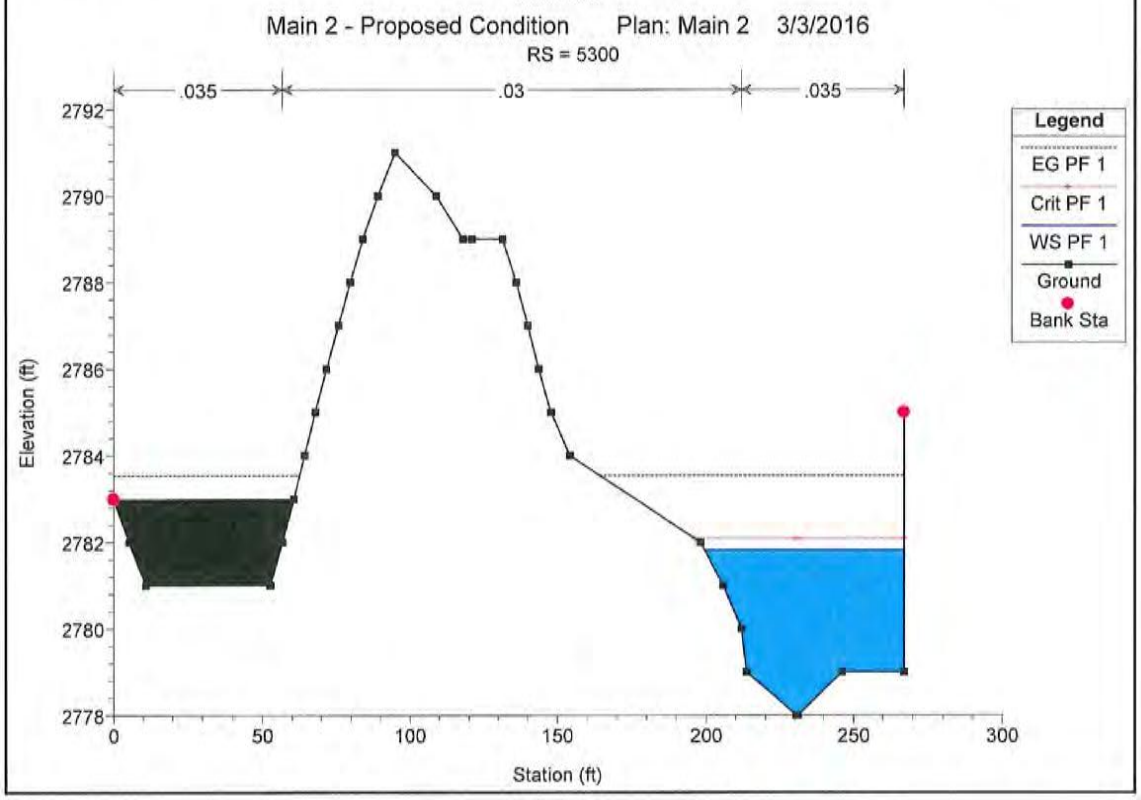
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

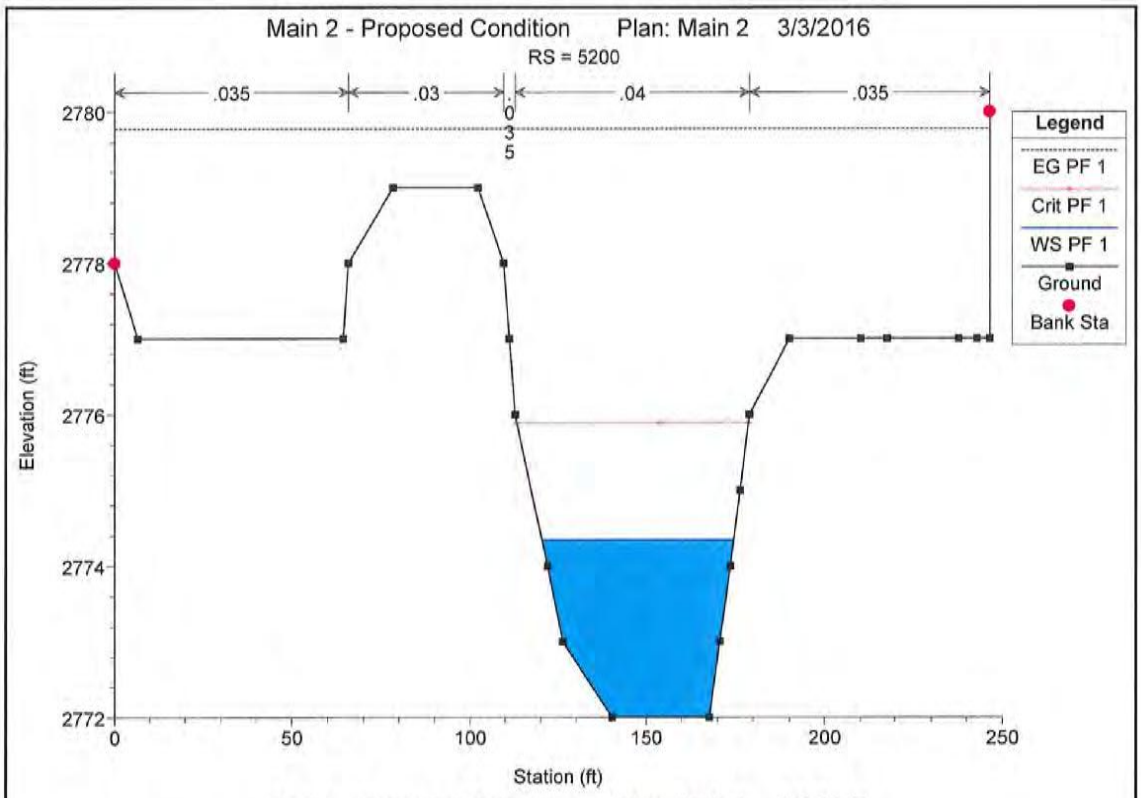
HEC-RAS Plan: Current mode River: Unnamed Lateral Reach: Lateral 1 Profile: PF 1

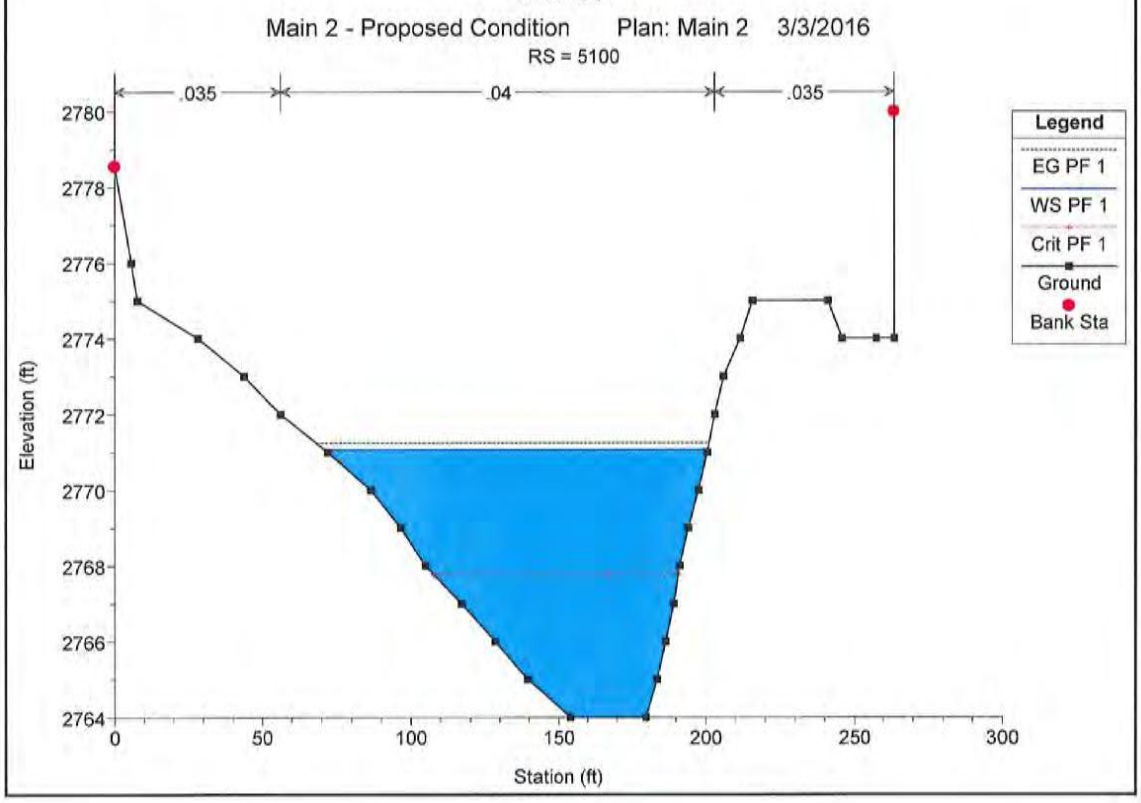
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lateral 1	5400	PF 1	1910.00	2780.00	2783.62	2783.62	2784.89	0.012079	9.02	211.82	85.32	1.01
Lateral 1	5300	PF 1	1910.00	2778.00	2781.81	2782.08	2783.53	0.015570	10.53	181.35	67.56	1.13
Lateral 1	5200	PF 1	1910.00	2772.00	2774.34	2775.89	2779.78	0.110770	18.71	102.10	54.29	2.40
Lateral 1	5100	PF 1	1910.00	2764.00	2771.06	2767.76	2771.25	0.001256	3.44	554.72	129.63	0.29
Lateral 1	5000	PF 1	1910.00	2759.39	2771.09	2764.36	2771.19	0.000416	2.48	771.61	127.62	0.18

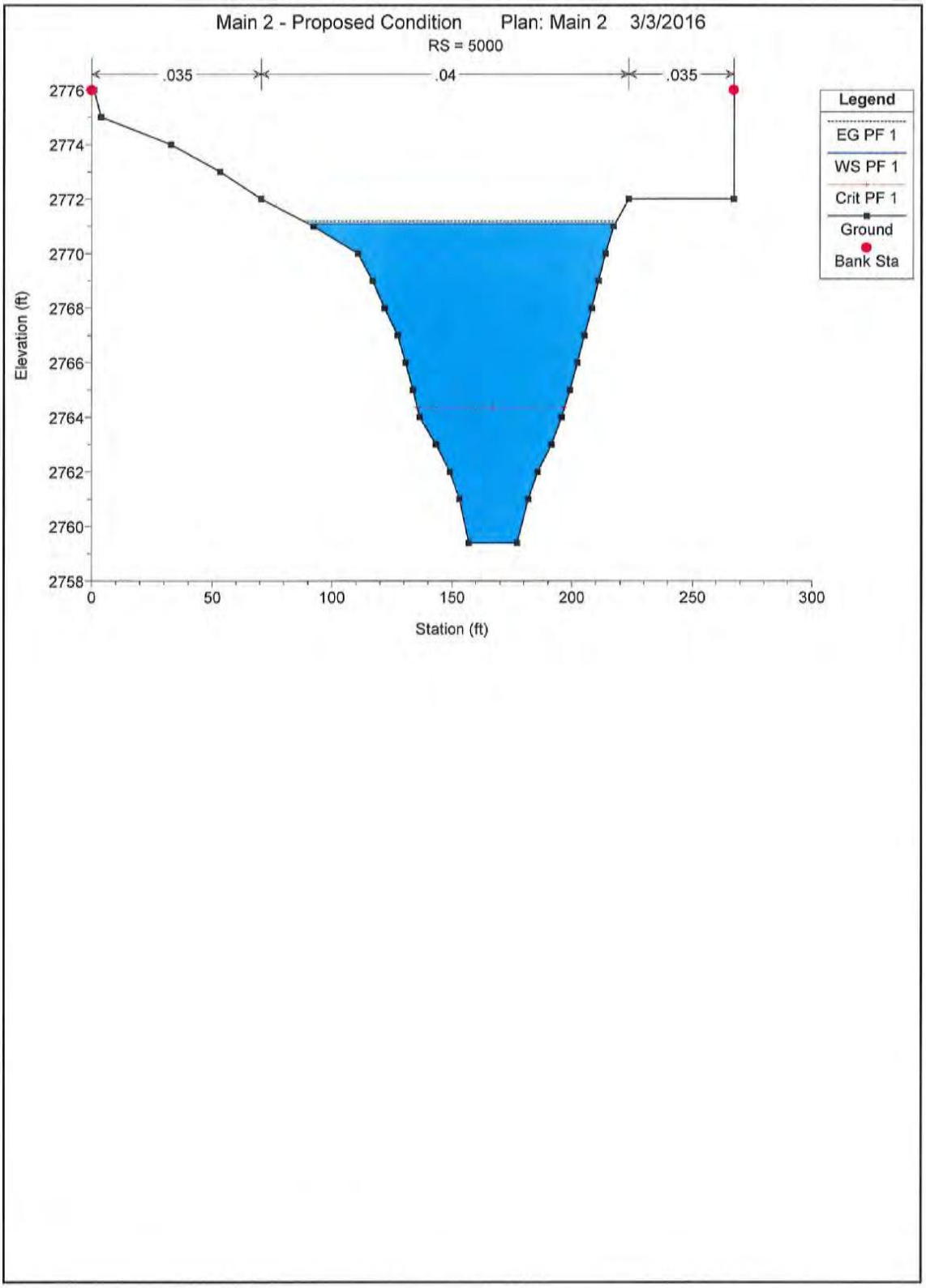

Main 2 - Proposed Condition
Plan: Main 2 3/3/2016
Unnamed Lateral Lateral 1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
2785
2780
2775
2770
2765
2760
2755
0
50
100
150
200
250
300
350
400
Main Channel Distance (ft)
5100
5200
5300
5400


Main 2 - Proposed Condition Plan: Main 2 3/3/2016
RS = 5400
.035
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Proposed Condition Plan: Main 2 3/3/2016
RS = 5300
.035
.03
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Proposed Condition Plan: Main 2 3/3/2016
RS = 5200
.035
.03
.04
.035
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Proposed Condition Plan: Main 2 3/3/2016
RS = 5100
.035
.04
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 2 - Proposed Condition Plan: Main 2 3/3/2016
RS = 5000
.035
.04
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2776
2774
2772
2770
2768
2766
2764
2762
2760
2758
0
50
100
150
200
250
300
Station (ft)

PROPOSED NDOT TYPE 2 DROP INLET W/ 18" RCP

FACILITY #2

	WEIR		ORIFICE
Q100 =	1	Q100 =	1
L =	8.69	CLEAR AREA =	3.5
		C =	0.65
CLOGGING FACTOR	50%	CLOGGING FACTOR	50%
ASSUME H1 =	0.19	ASSUME H1 =	0.19
C (FOR H1) =	2.7		
$Q_F = CL(H)^{3/2}$	1.0	Q = CA(64.4 H)1/2	6.1

CONTROL = WEIR

Q INT = 1.0

Note: H1 is measured from the top of the grate. Orifice calculations accounts for the 3-inch thickness of the grate

PIPE CULVERT

57B-1A: 48-inch RCP

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	355.0	ft
Slope	6.13	%
Manning's 'n'	0.013	
Flow "Q"	54	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	3.41	ft
Sq. Edge	3.16	ft
Beveled	3.03	ft
Tapered	3.27	ft.

OUTLET		
Head Water	N/A	ft
Critical	2.21	ft
Velocity	4.30	ft/s

G. C. WALLACE COMPANIES
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PIPE CULVERT

DON1: 48-INCH RCP

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	30.0	ft
Slope	3.57	%
Manning's 'n'	0.013	
Flow "Q"	34	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.53	ft
Sq. Edge	2.39	ft
Beveled	2.34	ft
Tapered	2.53	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.73	ft
Velocity	2.71	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

DON2: 48-inch RCP

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	30.0	ft
Slope	3.57	%
Manning's 'n'	0.013	
Flow "Q"	60	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	3.73	ft
Sq. Edge	3.45	ft
Beveled	3.29	ft
Tapered	3.46	ft.

OUTLET		
Head Water	N/A	ft
Critical	2.33	ft
Velocity	4.77	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

1/4 DON3: 24-INCH RCP

INPUT

Pipe Diameter	24	in
Number of Pipes	1	
Length	127.0	ft
Slope	0.30	%
Manning's 'n'	0.013	
Flow "Q"	16	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET

Thin Edge	2.58	ft
Sq. Edge	2.37	ft
Beveled	2.20	ft
Tapered	2.20	ft.

OUTLET

Head Water	2.52	ft
Critical	1.44	ft
Velocity	5.09	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

DON3: 48-INCH RCP

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	30.0	ft
Slope	2.00	%
Manning's 'n'	0.013	
Flow "Q"	33	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.52	ft
Sq. Edge	2.38	ft
Beveled	2.33	ft
Tapered	2.48	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.71	ft
Velocity	2.63	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

DON3: 48-INCH RCP

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	30.0	ft
Slope	2.00	%
Manning's 'n'	0.013	
Flow "Q"	38	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.76	ft
Sq. Edge	2.59	ft
Beveled	2.52	ft
Tapered	2.69	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.84	ft
Velocity	3.02	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

DON4

INPUT		
Pipe Diameter	36	in
Number of Pipes	1	
Length	30.0	ft
Slope	2.00	%
Manning's 'n'	0.013	
Flow "Q"	22	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.32	ft
Sq. Edge	2.17	ft
Beveled	2.09	ft
Tapered	2.22	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.51	ft
Velocity	3.11	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

CON3R: 72-inch RCP

INPUT		
Pipe Diameter	72	in
Number of Pipes	1	
Length	115.7	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	191	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	6.29	ft
Sq. Edge	5.81	ft
Beveled	5.50	ft
Tapered	5.63	ft.

OUTLET		
Head Water	4.92	ft
Critical	3.77	ft
Velocity	6.76	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

BOX CULVERT

CCON10_20x9RCB

INPUT

Width of Box	20.00	ft
Height of Box	9.00	ft
Number of Barrels	1	
Length	50.00	ft
Slope	0.99	%
Manning's 'n'	0.015	
Flow "Q"	2128	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

Non Standard Box Span

INLET

45d WWall	12.08	ft
Sq. Edge	12.72	ft
Beveled	11.71	ft
Tapered	58.70	ft

OUTLET

Head Water	10.62	ft
Critical	7.06	ft
Velocity	11.82	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

CON15R: 72-inch RCP

INPUT		
Pipe Diameter	72	in
Number of Pipes	1	
Length	92.9	ft
Slope	1.14	%
Manning's 'n'	0.013	
Flow "Q"	344	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	11.39	ft
Sq. Edge	9.88	ft
Beveled	8.85	ft
Tapered	8.27	ft.

OUTLET		
Head Water	8.17	ft
Critical	5.03	ft
Velocity	12.17	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

BOX CULVERT

CON18R_20x9RCB

INPUT

Width of Box	20.00	ft
Height of Box	9.00	ft
Number of Barrels	1	
Length	18.23	ft
Slope	9.59	%
Manning's 'n'	0.015	
Flow "Q"	1910	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

Non Standard Box Span

INLET

45d WWall	10.26	ft
Sq. Edge	10.85	ft
Beveled	9.92	ft
Tapered	42.32	ft

OUTLET

Head Water	8.44	ft
Critical	6.57	ft
Velocity	10.61	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

PIPE CULVERT

ON16R: 48-inch RCP

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	96.1	ft
Slope	0.50	%
Manning's 'n'	0.013	
Flow "Q"	23	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.04	ft
Sq. Edge	1.96	ft
Beveled	1.93	ft
Tapered	2.03	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.41	ft
Velocity	1.83	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

BOX CULVERT

CON22: Existing (2)12x12RCB

INPUT

Width of Box	12.00	ft
Height of Box	12.00	ft
Number of Barrels	2	
Length	100.00	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	4209	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET

45d WWall	17.07	ft
Sq. Edge	18.08	ft ←
Beveled	16.49	ft
Tapered	15.40	ft

OUTLET

Head Water	14.78	ft
Critical	12.00	ft
Velocity	14.61	ft/s

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

INV = 2666.75
18.08
2684.83 WSE

8320 old courthouse road • vienna, virginia 22180
© april 1979 (revised)

design data 7

depth to top of pipe, not invert

american concrete pipe association

CONCRETE PIPE SELECTION: Trench Installations

Trench conduits are usually installed in relatively narrow trenches excavated in undisturbed soil and backfilled to the original ground surface.

When a rigid conduit is installed in a narrow trench and backfilled, the backfill material will tend to settle. This downward movement generates frictional forces along the trench walls, which act upward to help support the weight of the backfill material. The magnitude of the frictional forces depends on the unit weight of the backfill material w, the value of Rankine's lateral pressure ratio K, and the coefficient of sliding friction μ' between the backfill material and the trench walls.

The backfill load on a conduit installed in a trench condition is equal to the weight of the mass of fill material within the trench less the summation of the frictional load transfers, and is expressed by the equation:

$$W_d = C_d \, w \, B_d^2$$

where

W_d=backfill load, pounds per linear foot
C_d=load coefficient for trench condition
w=unit weight of backfill material, pounds per cubic foot
B_d=width of trench at the top of the conduit, feet

Figures 2 through 5, based on the above equation, enable a direct determination of backfill load for a given trench width and depth of cover. As the trench width increases for a given depth of cover and pipe diameter, a point is reached at which an embankment condition develops. The curves showing pipe size indicate the limiting trench width for each pipe diameter beyond which greater trench widths will not affect the load. When this condition occurs, the load on the conduit remains constant. This load should be determined by the intersection of the vertical line representing the depth of cover and the dashed line representing the particular pipe diameter under consideration. For intermediate pipe sizes not shown in *Figures 2 through 5*, interpolation should be used.

The field supporting strength of a concrete pipe line is dependent on the inherent strength of the pipe, the type of foundation on which the pipe is installed and the compaction of the sidefill material adjacent to the pipe. A common method used to determine the inherent strength of a pipe is the three-edge bearing test, in which the pipe is subjected to concentrated loads at the crown and invert. The load that a pipe will support under this condition of loading is called the *three-edge bearing strength* and is expressed in pounds per linear foot.

ASTM Specification C14 covers three strength classes for non-reinforced concrete pipe — Class 1, 2 and 3. These three classes are specified to meet ultimate loads, expressed in terms of minimum strength in three-edge-bearing as listed in *Table I*.

TABLE I: Strength Requirements Non-reinforced Concrete Pipe ASTM C14

Pipe Diameter, Inches	Minimum Three-Edge Bearing Strengths, Pounds per Linear Foot		
	Class 1	Class 2	Class 3
4	1500	2000	2400
6	1500	2000	2400
8	1500	2000	2400
10	1600	2000	2400
12	1800	2250	2600
15	2000	2600	2900
18	2200	3000	3300
21	2400	3300	3850
24	2600	3600	4400
27	2800	3950	4600
30	3000	4300	4750
33	3150	4400	4875
36	3300	4500	5000

Another means of expressing pipe strength is in terms of D-load. The D-load of a pipe is the supporting strength of a pipe loaded under three-edge-bearing test conditions expressed in pounds per linear foot per foot of inside diameter. Thus the bearing strength may be converted to D-load by dividing by the inside diameter in feet.

ASTM Specification C76 specifies five strength classes reinforced concrete pipe. These strength classes are expressed in terms of D-load at 0.01-inch crack and for ultimate load. The D-load to produce the 0.01-inch crack $D_{0.01}$ is the maximum load applied to the concrete pipe before a crack occurs having a width of 0.01-inch measured at close intervals, throughout a length of at least 1-foot. The D-load to produce ultimate load D_u is the maximum three-edge-bearing test load carried by a pipe, expressed as D-load. *Table II* lists 0.01-inch crack and ultimate D-loads for the strength classes covered by ASTM Specification C76.

TABLE II: Strength Requirements Reinforced Concrete Pipe ASTM C76

Strength Class	Minimum D-Load in Three-Edge Bearing Pounds per Linear Foot per Foot of Internal Diameter	
	0.01 Inch Crack-$D_{0.01}$	Ultimate-D_u
I	800	1200
II	1000	1500
→ III	1350	2000
IV	2000	3000
V	3000	3750

Class III 0-1350
Class IV 1350-2000
Class V 2000-3000

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 24 IN. DIAMETER CIRCULAR PIPE

****

PIPE DATA

DIAMETER (in.)	24.00
WALL B, THICKNESS (in.)	3.000

INSTALLATION CONDITIONS

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	6.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.0165
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

ADDITIONAL LOADS

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

FACTORS OF SAFETY

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

ESULTS OF ANALYSIS

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SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
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PROGRAM SAMM

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.08	Y	378.	3008.	0.	3386.	1.90	891.	1337.
1.5	1.12	Y	591.	2400.	0.	2991.	1.90	787.	1181.
2.0	1.17	Y	820.	1781.	0.	2600.	1.90	684.	1026.
2.5	1.22	Y	1067.	1269.	0.	2336.	1.90	615.	922.
3.0	1.27	Y	1334.	927.	0.	2261.	1.90	595.	893.
3.5	1.33	Y	1623.	763.	0.	2386.	1.90	628.	942.
4.0	1.38	Y	1935.	641.	0.	2575.	1.90	678.	1017.
4.5	1.44	Y	2272.	546.	0.	2818.	1.90	742.	1112.
5.0	1.46	Y	2562.	472.	0.	3034.	1.90	798.	1197.
5.5	1.47	Y	2827.	412.	0.	3239.	1.90	852.	1278.
6.0	1.47	Y	3091.	363.	0.	3454.	1.90	909.	1363.
6.5	1.47	Y	3356.	322.	0.	3678.	1.90	968.	1452.
7.0	1.48	Y	3625.	288.	0.	3913.	1.90	1030.	1545.
7.5	1.48	Y	3889.	260.	0.	4149.	1.90	1092.	1638.
8.0	1.48	Y	4153.	235.	0.	4388.	1.90	1155.	1732.
8.5	1.48	Y	4417.	214.	0.	4631.	1.90	1219.	1828.
9.0	1.49	Y	4682.	195.	0.	4877.	1.90	1283.	1925.
9.5	1.49	Y	4946.	179.	0.	5125.	1.90	1349.	2023.
10.0	1.49	Y	5210.	165.	0.	5375.	1.90	1414.	2122.
10.5	1.49	Y	5474.	152.	0.	5627.	1.90	1481.	2221.
11.0	1.49	Y	5738.	141.	0.	5880.	1.90	1547.	2321.
11.5	1.49	Y	6003.	131.	0.	6134.	1.90	1614.	2421.
12.0	1.49	Y	6267.	122.	0.	6389.	1.90	1681.	2522.
12.5	1.49	Y	6531.	114.	0.	6645.	1.90	1749.	2623.
13.0	1.49	Y	6795.	107.	0.	6902.	1.90	1816.	2725.
13.5	1.49	Y	7060.	100.	0.	7160.	1.90	1884.	2826.

14.0	1.49	Y	7324.	94.	0.	7418.	1.90	1952.	2928.
14.5	1.50	Y	7588.	89.	0.	7677.	1.90	2020.	3020.
15.0	1.50	Y	7853.	84.	0.	7937.	1.90	2089.	3087.
15.5	1.50	Y	8117.	79.	0.	8196.	1.90	2157.	3151.
16.0	1.49	Y	8369.	75.	0.	8444.	1.90	2222.	3210.
16.5	1.49	Y	8633.	71.	0.	8704.	1.90	2291.	3269.
17.0	1.50	Y	8897.	68.	0.	8964.	1.90	2359.	3327.
17.5	1.50	Y	9160.	64.	0.	9225.	1.90	2428.	3382.
18.0	1.50	Y	9424.	61.	0.	9485.	1.90	2496.	3435.
18.5	1.50	Y	9688.	58.	0.	9746.	1.90	2565.	3485.
19.0	1.50	Y	9952.	56.	0.	10008.	1.90	2634.	3533.
19.5	1.50	Y	10216.	53.	0.	10269.	1.90	2702.	3579.
20.0	1.50	Y	10480.	51.	0.	10530.	1.90	2771.	3622.

DATE: / /

DESIGNER:

PROGRAM SAMM-

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 36 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	36.00
WALL B, THICKNESS (in.)	4.000

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	7.67
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1650
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

RESULTS OF ANALYSIS

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SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
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PROGRAM SAMM

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.05	Y	537.	2814.	0.	3351.	1.90	588.	882.
2.0	1.10	Y	1125.	2326.	0.	3450.	1.90	605.	908.
3.0	1.15	Y	1768.	1227.	0.	2995.	1.90	525.	788.
4.0	1.20	Y	2472.	857.	0.	3329.	1.90	584.	876.
5.0	1.26	Y	3241.	637.	0.	3878.	1.90	680.	1021.
6.0	1.33	Y	4084.	494.	0.	4577.	1.90	803.	1205.
7.0	1.39	Y	5006.	395.	0.	5400.	1.90	947.	1421.
8.0	1.43	Y	5871.	323.	0.	6194.	1.90	1087.	1630.
9.0	1.43	Y	6630.	270.	0.	6899.	1.90	1210.	1816.
10.0	1.44	Y	7387.	229.	0.	7616.	1.90	1336.	2004.
11.0	1.44	Y	8154.	197.	0.	8351.	1.90	1465.	2198.
12.0	1.45	Y	8911.	171.	0.	9082.	1.90	1593.	2390.
13.0	1.45	Y	9668.	150.	0.	9817.	1.90	1722.	2584.
14.0	1.45	Y	10424.	132.	0.	10557.	1.90	1852.	2778.
15.0	1.45	Y	11181.	118.	0.	11298.	1.90	1982.	2973.
16.0	1.45	Y	11937.	106.	0.	12043.	1.90	2113.	3110.
17.0	1.45	Y	12693.	95.	0.	12789.	1.90	2244.	3229.
18.0	1.46	N	13446.	86.	0.	13533.	1.90	2374.	3339.
19.0	1.43	N	13930.	79.	0.	14009.	1.90	2458.	3405.
20.0	1.40	N	14394.	72.	0.	14466.	1.90	2538.	3466.

III

IV

V

DATE: / /

DESIGNER:

```
SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
       SS   AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
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P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

DATE:

DESIGNER:

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 48 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	48.00
WALL B, THICKNESS (in.)	5.000

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	0.50
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	8.83
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

RESULTS OF ANALYSIS

```
SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
```

PROGRAM SAMM

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
0.5	1.02	Y	345.	2584.	0.	2929.	1.90	385.	578.
1.0	1.04	Y	704.	2331.	0.	3035.	1.90	399.	599.
1.5	1.06	Y	1078.	2623.	0.	3701.	1.90	487.	731.
2.0	1.08	Y	1467.	2475.	0.	3942.	1.90	519.	778.
2.5	1.11	Y	1872.	1994.	0.	3866.	1.90	509.	763.
3.0	1.13	Y	2293.	1474.	0.	3766.	1.90	496.	743.
3.5	1.15	Y	2731.	1226.	0.	3957.	1.90	521.	781.
4.0	1.18	Y	3187.	1039.	0.	4226.	1.90	556.	834.
4.5	1.20	Y	3662.	893.	0.	4555.	1.90	599.	899.
5.0	1.23	Y	4156.	778.	0.	4933.	1.90	649.	974.
5.5	1.25	Y	4670.	684.	0.	5353.	1.90	704.	1057.
6.0	1.28	Y	5204.	606.	0.	5811.	1.90	765.	1147.
6.5	1.31	Y	5761.	542.	0.	6303.	1.90	829.	1244.
III 7.0	1.34	Y	6340.	487.	0.	6827.	1.90	898.	1348.
7.5	1.37	Y	6943.	441.	0.	7384.	1.90	972.	1457.
8.0	1.40	Y	7570.	401.	0.	7971.	1.90	1049.	1573.
8.5	1.43	Y	8222.	366.	0.	8589.	1.90	1130.	1695.
9.0	1.46	Y	8884.	336.	0.	9220.	1.90	1213.	1820.
9.5	1.46	Y	9394.	309.	0.	9703.	1.90	1277.	1915.
10.0	1.47	Y	9917.	286.	0.	10203.	1.90	1343.	2014.
10.5	1.47	Y	10429.	265.	0.	10694.	1.90	1407.	2111.
11.0	1.47	Y	10940.	246.	0.	11187.	1.90	1472.	2208.
11.5	1.47	Y	11452.	230.	0.	11681.	1.90	1537.	2306.
IV 12.0	1.47	N	11954.	215.	0.	12169.	1.90	1601.	2402.
12.5	1.46	N	12345.	201.	0.	12546.	1.90	1651.	2476.
13.0	1.45	N	12729.	189.	0.	12918.	1.90	1700.	2550.

13.5	1.43	N	13106.	177.	0.	13283.	1.90	1748.	2622.
14.0	1.42	N	13475.	167.	0.	13643.	1.90	1795.	2693.
14.5	1.41	N	13838.	158.	0.	13996.	1.90	1842.	2762.
15.0	1.40	N	14195.	149.	0.	14344.	1.90	1887.	2831.
15.5	1.39	N	14544.	141.	0.	14685.	1.90	1932.	2898.
16.0	1.38	N	14887.	134.	0.	15021.	1.90	1976.	2965.
16.5	1.36	N	15224.	127.	0.	15351.	1.90	2020.	3020.
17.0	1.35	N	15555.	121.	0.	15676.	1.90	2063.	3062.
17.5	1.34	N	15879.	115.	0.	15994.	1.90	2105.	3102.
18.0	1.33	N	16197.	110.	0.	16307.	1.90	2146.	3140.
18.5	1.32	N	16510.	105.	0.	16615.	1.90	2186.	3177.
19.0	1.31	N	16817.	100.	0.	16917.	1.90	2226.	3213.
19.5	1.30	N	17118.	96.	0.	17213.	1.90	2265.	3247.
20.0	1.29	N	17413.	92.	0.	17505.	1.90	2303.	3280.

DATE: / /

DESIGNER:

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 72 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	72.00
WALL B, THICKNESS (in.)	7.000

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	25.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	11.17
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

R E S U L T S O F A N A L Y S I S

PIPE DEPTH (ft.)	------EARTH LOAD----- ARCHING FACTOR	>TRANS	LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.03	Y	1031.	1735.	0.	2766.	1.90	243.	364.
1.5	1.04	Y	1567.	2580.	0.	4147.	1.90	364.	546.
2.0	1.06	Y	2118.	2185.	0.	4303.	1.90	377.	566.
2.5	1.07	Y	2684.	1810.	0.	4494.	1.90	394.	591.
3.0	1.09	Y	3266.	1574.	0.	4840.	1.90	425.	637.
3.5	1.10	Y	3863.	1509.	0.	5373.	1.90	471.	707.
4.0	1.12	Y	4477.	1327.	0.	5804.	1.90	509.	764.
4.5	1.13	Y	5107.	1148.	0.	6255.	1.90	549.	823.
5.0	1.15	Y	5755.	1005.	0.	6759.	1.90	593.	889.
5.5	1.16	Y	6420.	888.	0.	7308.	1.90	641.	962.
6.0	1.18	Y	7103.	791.	0.	7894.	1.90	692.	1039.
6.5	1.20	Y	7805.	710.	0.	8515.	1.90	747.	1120.
7.0	1.21	Y	8525.	642.	0.	9167.	1.90	804.	1206.
III 7.5	1.23	Y	9266.	583.	0.	9849.	1.90	864.	1296.
8.0	1.25	Y	10026.	532.	0.	10558.	1.90	926.	1389.
8.5	1.27	Y	10808.	488.	0.	11295.	1.90	991.	1486.
9.0	1.29	Y	11610.	449.	0.	12059.	1.90	1058.	1587.
9.5	1.30	Y	12435.	414.	0.	12849.	1.90	1127.	1691.
10.0	1.32	Y	13281.	384.	0.	13665.	1.90	1199.	1798.
10.5	1.34	N	14117.	357.	0.	14474.	1.90	1270.	1905.
11.0	1.33	N	14686.	333.	0.	15019.	1.90	1317.	1976.
11.5	1.32	N	15247.	311.	0.	15558.	1.90	1365.	2047.
12.0	1.31	N	15800.	291.	0.	16091.	1.90	1411.	2117.
12.5	1.30	N	16344.	273.	0.	16618.	1.90	1458.	2187.
13.0	1.29	N	16881.	257.	0.	17138.	1.90	1503.	2255.
13.5	1.29	N	17409.	242.	0.	17652.	1.90	1548.	2323.
14.0	1.28	N	17930.	229.	0.	18159.	1.90	1593.	2389.
14.5	1.27	N	18444.	216.	0.	18660.	1.90	1637.	2455.
15.0	1.26	N	18949.	205.	0.	19154.	1.90	1680.	2520.
IV 15.5	1.25	N	19448.	194.	0.	19642.	1.90	1723.	2584.
16.0	1.24	N	19939.	185.	0.	20123.	1.90	1765.	2648.
16.5	1.23	N	20422.	176.	0.	20598.	1.90	1807.	2710.
17.0	1.23	N	20899.	167.	0.	21066.	1.90	1848.	2772.
17.5	1.22	N	21369.	160.	0.	21528.	1.90	1888.	2833.
18.0	1.21	N	21832.	152.	0.	21984.	1.90	1928.	2893.
18.5	1.20	N	22288.	146.	0.	22433.	1.90	1968.	2952.
19.0	1.19	N	22737.	139.	0.	22876.	1.90	2007.	3007.
19.5	1.18	N	23180.	133.	0.	23313.	1.90	2045.	3044.
20.0	1.18	N	23616.	128.	0.	23744.	1.90	2083.	3081.
20.5	1.17	N	24046.	123.	0.	24168.	1.90	2120.	3116.
V 21.0	1.16	N	24469.	118.	0.	24587.	1.90	2157.	3151.
21.5	1.15	N	24887.	113.	0.	25000.	1.90	2193.	3184.
22.0	1.15	N	25298.	109.	0.	25407.	1.90	2229.	3216.
22.5	1.14	N	25703.	105.	0.	25808.	1.90	2264.	3246.
23.0	1.13	N	26102.	101.	0.	26203.	1.90	2299.	3276.
23.5	1.12	N	26496.	97.	0.	26593.	1.90	2333.	3305.
24.0	1.12	N	26883.	94.	0.	26977.	1.90	2366.	3333.

24.5	1.11	N	27265.	91.	0.	27356.	1.90	2400.	3360.
25.0	1.10	N	27642.	87.	0.	27729.	1.90	2432.	3386.

DATE: / /

DESIGNER:

APPENDIX C

Referenced Material and Supporting Documents (On CD)

SUPPLEMENT NO. 1 TO THE 2nd UPDATE TO THE TECHNICAL DRAINAGE STUDY FOR QUEENS BOROUGH CULVERT

619.295

MARCH 2006

Prepared for:

JMA Architecture Studios
10150 Covington Cross Drive
Las Vegas, Nevada 89144
Phone: (702) 731- 2033
Fax: (702) 731- 2039

Prepared by:

G. C. Wallace, Inc.
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2297

619.295

RECEIVED

APR 26 2006

G.C. WALLACE

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 21, 2006
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for:			**COPIES TO:**
Queens Borrough Culvert (Plans AKA : The Village at Queensridge Culvert)				G. C. Wallace, Inc.
Cross Streets:	NEC of Alta Drive & Rampart Boulevard			JMA Architecture
File Number:	F:\Depot\DSMEMOS\DS3674F.ZNA.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-32-601-003			CCRFCD
FEMA Flood Zone	YES	X	NO	
Proposed Storm Drain	YES	X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	10/25/2004	11/9/2004	Not Approved	$400.00	11413: $400
2nd Submittal	12/6/2004	12/20/2004	See Comments Below	$400.00	13199: $400
3rd Submittal	3/4/2005	3/18/2005	Conditionally Approved	N/C	--
4th Submittal	8/9/2005	8/23/2005	See Comments Below	$400.00	27281: $400
5th Submittal	12/15/2005	12/30/2005	See Comments Below	$400.00	35359: $400
6th Submittal	2/28/2006 3/30/2006 & 4/20/2006	4/21/2006	See Comments Below	N/C	N/C
			TOTAL FEES (LDDRS):	**$1,600.00**	**----**

REMARKS: 6th Submittal: Revised the on-site RCB alignment at the northeast corner of the site. Revised the RCB outfall structure, to include additional grading within Angel Park and the relocation of the concrete access road.

The Drainage Study for the subject project has been reviewed and:

X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. The existing 48'-public drainage easement (Doc # 20051129:04185) must be vacated and a new easement dedicated to reflect the revised storm drain location. Provide a new legal description and exhibit to the Right-of-Way Section with a copy to Flood Control for review and approval. The revised easement must record concurrently with the vacated easement. The new easement must record prior to the final approval of the future technical drainage study needed for onsite development or approval of any final maps. **It is noted that the public drainage easement must be privately maintained both on the surface and within the box culvert.**

2. The revised plans for the storm drain system (CLV # 107y4889-CUL) must be submitted to Land Development for approval of this proposed revision.

3. The engineer has provided a copy of the FEMA Conditional Letter of Map Revision (CLOMR), Case No. 05-09-0420R for the subject project. The engineer is advised that they are required to obtain FEMA approval for this revision as well as the completed "As-Built" condition in order to obtain the Letter of Map Revision (LOMR). **The approved LOMR must be submitted to the City of Las Vegas prior to the release of the bond.**

NOTE: **The engineer must submit the drainage study to FEMA for a Conditional Letter of Map Revision (CLOMR). A favorable CLOMR must be obtained prior to the issuance of any permits.** This site is located in a **FEMA Zone A**. Clark County Regional Flood Control District (CCRFCD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCD for review. **The developer/engineer must also obtain a Letter of Map Revision (LOMR) using the approved drainage study as technical support to inform FEMA of the modifications within the flood zone. The approved LOMR must be submitted to the City of Las Vegas prior to the release of the bond.** FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the City of Las Vegas Flood Control Section prior to scheduling a framing inspection.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
B&H/ays/pbj

T/R/S: T20S/R60E/32
AREA L-32

ENGINEERS PLANNERS SURVEYORS

G. C. WALLACE, INC.

Writer's Contact Information:
804-2029

619.295

March 30, 2006

Albert Sung, PE
Flood Control Project Manager
City of Las Vegas Land Development Services
731 South Fourth Street
Las Vegas, Nevada 89101

Re: Supplement No. 1 to the 2nd Update to the Technical Drainage Study for Queens Borough Culvert (DS3674)

Dear Mr. Sung:

The purpose of this letter is to amend the design submitted within the *2nd Update to the Technical Drainage Study for Queens Borough Culvert* (DS3674). The proposed amendments are at the City of Las Vegas' request and are as follows:

> The existing embankment, located approximately 180 feet east of the RCB headwall, will be removed. Since removal of this embankment section produces increased flow velocity within the channel, a 95-foot long riprap pad (d50 = 24-inches; thickness = 48-inches) is proposed at the RCB outlet. The WSPGW calculations have been revised to model the embankment removal.
>
> As a result of the proposed channel improvements, the RCB access road alignment has been shifted. The revised access road cross-section detail and profile are provided with the grading packet. The proposed revisions do not adversely impact the adjacent properties or downstream facilities and are in agreement with the City of Las Vegas' drainage criteria.

Copies of the water surface profile model, RCB outlet protection calculations, and proposed grading plans are provided in the Appendix.

If you have any questions or require additional information, please contact me at 804-2029.

Very truly yours,

G. C. WALLACE, INC.

Cindy Kinzer, EI
Designer

Christopher M. Luquette, PE, CFM
Project Manager
Flood Control Division

CML/CK/jj

Enc.

c: Roy Clark, GCW

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W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1622
WATER SURFACE PROFILE LISTING

Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS
GCWALLACE PROJECT # 619.295
FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-3625.000	14.000	7.834	21.834	4497.00	17.38	4.69	26.53	.00	9.28	62.96		1		0 .0
TRANS STR	.0400					.0187	1.41	7.83	1.51		.035			IR-
OPEN														
-3550.000	17.000	8.266	25.266	4497.00	13.55	2.85	28.12	.00	8.27	58.19		2		0 .0
TRANS STR	.0100					.0070	.35	8.27	1.00		.035			IR-
OPEN														
-3500.000	17.500	10.031	27.531	4497.00	8.46	1.11	28.64	.00	7.33	75.12		3		0 .0
TRANS STR	.0328							10.031	.561		.040			IR-
OPEN														
-3401.010	20.750	2.481	23.231	4497.00	31.66	15.56	38.79	.00	5.67	63.50		4		0 .0
TRANS STR	.0110					.0371	1.86	2.48	3.73		.015			IR-
OPEN														
-3350.810	21.300	2.522	23.822	4497.00	33.25	17.16	40.99	.00	5.89	59.13		5		0 .0
TRANS STR	.0141					.0413	1.03	2.52	3.87		.015			IR-
OPEN														
-3325.950	21.650	2.323	23.973	4497.00	34.29	18.26	42.23	.00	5.71	60.97		6		0 .0
TRANS STR	.0160					.0340	.34	2.32	4.12		.015			IR-
OPEN														
-3315.950	21.810	5.925	27.735	4497.00	31.62	15.53	43.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
90.310	.0152					.0249	2.24	5.93	2.34	7.02	.015	.00	.00	BOX
-3225.640	23.180	5.731	28.911	4497.00	32.69	16.60	45.51	.00	10.29	25.00	12.000	25.000	.00	1 1.0
2.320	-.0776					.0263	.06	5.73	2.46	.00	.015	.00	.00	BOX
-3223.320	23.000	5.682	28.682	4497.00	32.98	16.89	45.57	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
70.620	.0283					.0264	1.86	12.00	2.49	5.55	.015	.00	.00	BOX

Program Package Serial Number: 1622

WATER SURFACE PROFILE LISTING

Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS

GCWALLACE PROJECT # 619.295

FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-3152.700	25.000	5.709	30.709	4497.00	32.82	16.73	47.44	.00	10.29	25.00	12.000	25.000	.00	1 1.0
17.410	.0276					.0262	.46	5.71	2.47	5.60	.015	.00	.00	BOX
-3135.290	25.480	5.714	31.194	4497.00	32.79	16.70	47.89	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
85.300	.0279					.0260	2.21	12.00	2.47	5.58	.015	.00	.00	BOX
-3049.990	27.860	5.748	33.608	4497.00	32.60	16.50	50.11	.00	10.29	25.00	12.000	25.000	.00	1 1.0
143.470	.0279					.0253	3.63	5.75	2.45	5.58	.015	.00	.00	BOX
-2906.520	31.860	5.829	37.689	4497.00	32.15	16.05	53.73	.40	10.29	25.00	12.000	25.000	.00	1 1.0
203.401	.0278					.0238	4.83	6.22	2.39	5.58	.015	.00	.00	BOX
-2703.119	37.523	6.024	43.546	4497.00	31.11	15.02	58.57	.37	10.29	25.00	12.000	25.000	.00	1 1.0
165.794	.0278					.0214	3.54	6.39	2.28	5.58	.015	.00	.00	BOX
-2537.325	42.138	6.318	48.456	4497.00	29.66	13.66	62.11	.34	10.29	25.00	12.000	25.000	.00	1 1.0
103.695	.0278					.0188	1.95	6.65	2.12	5.58	.015	.00	.00	BOX
-2433.630	45.025	6.626	51.651	4497.00	28.28	12.42	64.07	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.182	.0278					.0168	1.01	12.00	1.98	5.58	.015	.00	.00	BOX
-2373.448	46.700	6.888	53.588	4497.00	27.20	11.49	65.08	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
55.228	.0278					.0150	.83	12.00	1.86	5.58	.015	.00	.00	BOX
-2318.220	48.238	7.224	55.462	4497.00	25.94	10.45	65.91	.00	10.29	25.00	12.000	25.000	.00	1 1.0
26.702	.0278					.0136	.36	7.22	1.74	5.58	.015	.00	.00	BOX

Program Package Serial Number: 1622

WATER SURFACE PROFILE LISTING Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS

GCWALLACE PROJECT # 619.295

FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2291.518	48.982	7.440	56.421	4497.00	25.19	9.85	66.27	.00	10.29	25.00	12.000	25.000	.00	1 1.0
34.206	.0278					.0123	.42	7.44	1.66	5.58	.015	.00	.00	BOX
-2257.313	49.934	7.803	57.737	4497.00	24.01	8.95	66.69	.00	10.29	25.00	12.000	25.000	.00	1 1.0
25.506	.0278					.0109	.28	7.80	1.55	5.58	.015	.00	.00	BOX
-2231.807	50.644	8.184	58.828	4497.00	22.90	8.14	66.97	.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.679	.0278					.0096	.18	8.18	1.44	5.58	.015	.00	.00	BOX
-2213.128	51.164	8.583	59.748	4497.00	21.83	7.40	67.15	.00	10.29	25.00	12.000	25.000	.00	1 1.0
13.128	.0278					.0085	.11	8.58	1.34	5.58	.015	.00	.00	BOX
-2200.000	51.530	9.002	60.532	4497.00	20.81	6.73	67.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.785	.0080					.0080	.49	9.00	1.25	9.00	.015	.00	.00	BOX
-2139.215	52.016	9.002	61.018	4497.00	20.81	6.73	67.75	.00	10.29	25.00	12.000	25.000	.00	1 1.0
405.355	.0080					.0077	3.13	9.00	1.25	9.00	.015	.00	.00	BOX
-1733.860	55.259	9.255	64.514	4497.00	20.24	6.36	70.88	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
54.700	.0080					.0074	.40	12.00	1.20	9.00	.015	.00	.00	BOX
-1679.160	55.697	9.355	65.051	4497.00	20.03	6.23	71.28	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
95.423	.0080					.0069	.65	12.00	1.18	9.00	.015	.00	.00	BOX
-1583.737	56.460	9.811	66.271	4497.00	19.10	5.66	71.93	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.737	.0080					.0061	.11	12.00	1.10	9.00	.015	.00	.00	BOX

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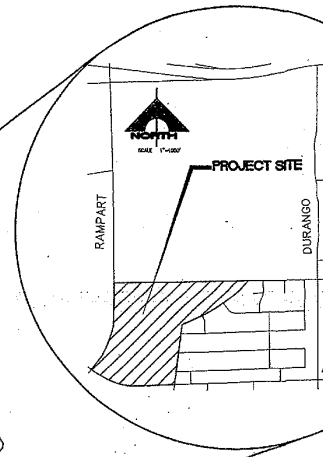
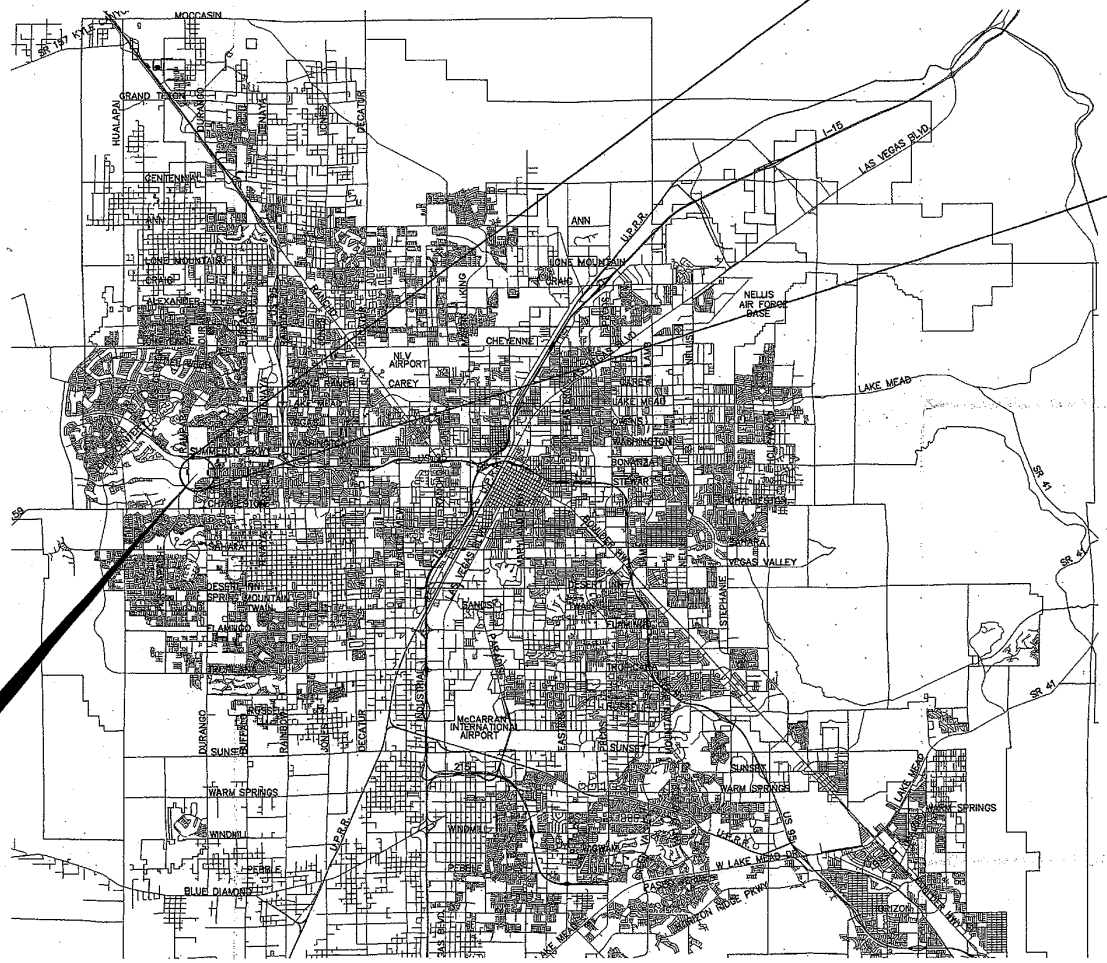
FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-1565.000	56.610	10.291	66.901	4497.00	18.21	5.15	72.05	.00	10.29	25.00	12.000	25.000	.00	1 1.0
88.377	.0050					.0051	.45	10.29	1.02	10.85	.015	.00	.00	BOX
-1476.623	57.053	10.793	67.846	4497.00	17.36	4.68	72.53	.00	10.29	25.00	12.000	25.000	.00	1 1.0
257.531	.0050					.0050	1.29	10.79	.95	10.85	.015	.00	.00	BOX
-1219.092	58.343	10.853	69.196	4497.00	17.26	4.63	73.82	.00	10.29	25.00	12.000	25.000	.00	1 1.0
219.092	.0050					.0050	1.10	10.85	.94	10.85	.015	.00	.00	BOX
---------- WARNING - Flow depth near top of box conduit ----------														
-1000.000	59.440	10.853	70.293	4497.00	17.26	4.63	74.92	.00	10.29	25.00	12.000	25.000	.00	1 1.0

IMPROVEMENT PLANS
FOR
THE VILLAGE AT QUEENSRIDGE
CULVERT
CITY OF LAS VEGAS
STATE OF NEVADA
APN# 138-32-601-003





NOTE: ALL LAND SURFACE AREA DISTURBANCES OVER 1
REQUIRE A STORMWATER DISCHARGE PERMIT ISSUED BY
DIVISION OF ENVIRONMENTAL PROTECTION (NDEP). A PH
CONSTRUCTION UNIT IN A CONTIGUOUS SUBDIVISION IS C
UNDER CONSTRUCTION UNTIL ALL STRIPPED OR DISTURBE
AREAS HAVE BEEN COVERED BY PAVING, BUILDING CONS
PLANTING. A STORMWATER DISCHARGE PERMIT APPLICAT
ASSOCIATED INFORMATION MAY BE DOWNLOADED FROM T
HTTP://WWW.STATE.NV.US/NDEP/BWPC/STORMO1.HTM
PROJECTS THAT DISTURB MORE THAN ONE ACRE OF LAN
SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION
STORMWATER PERMIT NO. NVR100000 ALONG WITH THE A
FILING FEE.

BASIS OF BEARING

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CEN
"RAMPART BOULEVARD" AS SHOWN BY MAP THEREOF ON
84, PAGE 93 OF SURVEYS IN THE COUNTY RECORDER'S O
COUNTY, NEVADA, LYING WITHIN THE NORTH HALF (N 1/2
32, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., CITY
CLARK COUNTY, NEVADA.

BENCHMARK

RIVET AND PLATE IN TOP OF CURB @ TOWN CENTER AND
VILLAGE CENTER ON WEST EDGE OF ROUNDABOUT.

CITY OF LAS VEGAS BENCHMARK OLV00 32E6
LOCATED ON THE NORTHEAST CORNER OF ALTA DR. AND
NAVD 88 ELEVATION = 814.1281 METERS, 2671.02 FEET
SUMMERLIN ELEVATION: 2726.11 FEET

NOTE: ADD 2.27' TO THE CURRENTLY USED SUMMERLIN E
TO EQUAL TO THE APPROVED CITY OF LAS VEGAS

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".

2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.

3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REQUIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.

4. ALL CONSTRUCTION SHALL BE SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.

5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @28 DAYS. MIX DESIGN TO BE APPROVED BY THE CITY ENGINEER, PRIOR TO THE USE ON THE PROJECT.

6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.

7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 150' IN EXTRUDED-TYPE CURB, PER SUMMERLIN IMPROVEMENT STANDARDS.

8. AC PAVEMENT TO BE ONE-HALF INCH (1/2") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.

9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER SUMMERLIN STANDARD DRAWING S-47.

10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD SUMMERLIN DRAWINGS. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.

11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF TRANSITIONS TO BE AS SHOWN ON PLANS.

12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY TERRACON, PROJECT NO. 64965481, APPROVED BY THE CITY ENGINEER AND AS SHOWN ON THESE PLANS.

13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.

14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. NO. 625.550.

15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

16. WALL NOTES: ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.

17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT-OF-WAY.

18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.

19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.

2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES.

3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.

4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.

5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.

6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'+	+0.1' TO -0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.

8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.

9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC, SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.

10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.

CITY OF LAS VEGAS FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CITY OF LAS VEGAS FIRE DEPARTMENT'S ORDINANCE # 5667, "HYDRANT SPECIFICATIONS", AND "HYDRANT INSTALLATION SPECIFICATION".

2. AUTHORIZED HYDRANTS FOR THIS PROJECT ARE:
   A. KENNEDY – GUARDIAN MODELS K81A AND K81D
   B. MUELLER – SUPER CENTURION 250 MODEL A-423
   C. CLOW – MEDALLION MODEL F-2548LVD
   D. U.S. PIPE – METROFLOW/M-D3
   E. TROY VALVE – PATRIOT MODEL PTB10DN NEVADA HYDRANT

3. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW.

4. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF STREET ADJACENT TO THE FIRE HYDRANTS AS REQUIRED BY ORDINANCE # 5667.

5. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CALL THE CITY OF LAS VEGAS INSPECTION HOT-LINE AT 229-2071 TO REQUEST AN INSPECTION BY THE CITY OF LAS VEGAS FIRE DEPARTMENT.

6. PAINTING OF THE CURBS AND FIRE HYDRANTS AND ALL OTHER WORK NECESSARY AS REQUIRED BY ORDINANCE # 5667, FOR THE PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, SHALL BE COMPLETED BEFORE APPROVAL BY THE CITY OF LAS VEGAS FIRE DEPARTMENT.

7. A PERMIT IS REQUIRED FROM THE CITY OF LAS VEGAS FIRE DEPARTMENT FOR THE ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.

8. PRIVATE FIRE HYDRANTS SHALL BE PAINTED RED.

9. PRIOR TO THE FINAL OCCUPANCY, A FLOW TEST MUST BE WITNESSED BY THE CITY OF LAS VEGAS FIRE DEPARTMENT TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW.

10. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A. APPROVED, AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE.

11. FIRE HYDRANTS SPACING SHALL BE:
    RESIDENTIAL – 500 FEET UNSPRINKLERED; 600 FEET SPRINKLERED.
    COMMERCIAL – 300 FEET UNSPRINKLERED; 400 FEET SPRINKLERED.

12. WHERE NEW WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT MAXIMUM 1,000 FOOT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FEET ON AN ALTERNATING BASIS.

13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE REQUIRED RADIUS OF A CUL-DE-SAC OR WITHIN 20 FEET OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.

14. NO FIRE HYDRANT SHALL BE LOCATED WITHIN 6 FEET OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREET LIGHT OR ANY OTHER OBSTRUCTION.

15. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FEET, AS MEASURED BY AN APPROVED ROUTE.

16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FEET, AS MEASURED BY AN APPROVED ROUTE.

17. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FEET.

18. TWO SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE ARE 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.

19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS.

20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12%. ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FEET PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%.

21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FEET OUTSIDE AND 28 FEET INSIDE TURNING RADIUS.

22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL BE NOT LESS THAN 13 FEET 6 INCHES.

23. FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT FOR THE APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FEET FLOW LINE TO THE FLOW LINE (THIS WIDTH MAY BE REDUCED TO 24 FEET, IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED) FOR MAIN RESIDENTIAL STREETS, WITH PARKING PERMITTED ON BOTH SIDES OF THE STREET. PRIVATE DRIVE AISLES, DRIVEWAYS, ETC. SHALL BE ALLOWED TO BE REDUCED TO A MINIMUM WIDTH OF 24 FEET WIDE FLOW LINE TO THE FLOW LINE WHEN SERVING NO MORE THAN 6 RESIDENCES, AND WHEN ON STREET PARKING IS DISALLOWED.

24. ALL FIRE APPARATUS ACCESS ROADS IN COMMERCIAL DEVELOPMENTS AND APARTMENT COMPLEXES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FEET (FLOW LINE TO THE FLOW LINE), PROVIDED NO PARKING IS ALLOWED ON EITHER SIDE; 32 FEET (FLOW LINE TO THE FLOW LINE) IF PARALLEL PARKING IS ALLOWED ON ONE SIDE ONLY; AND 40 FEET (FLOW LINE TO THE FLOW LINE), IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES. THESE WIDTHS MAY BE REDUCED BY 4 FEET IF ALL BUILDINGS ARE SPRINKLERED.

25. A FIRE DEPARTMENT ACCESS ROAD SHALL EXTEND TO WITHIN 50 FEET OF A SINGLE EXTERIOR DOOR PROVIDING ACCESS TO THE INTERIOR OF THE BUILDING.

26. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FEET FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FEET IF THE BUILDING IS SPRINKLERED.

27. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FEET, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS.

28. ALL DEAD-END FIRE APPARATUS ACCESS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FEET IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND AREA HAVING A MINIMUM DIAMETER OF 81 FEET.

29. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS 100 FEET ALONG ALL DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FEET OR LESS THAN 8 FEET FROM ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT IF A CURB IS NOT PROVIDED SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS.

30. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY VEHICLE ACCESS GATES.

CITY FIRE MARSHALL DATE

REVISED 03/19/04

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION.

LAS VEGAS VALLEY WATER DISTRICT STANDARD NO

LVVWD PROJECT#_____

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY T LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICA SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED

   WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.

2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND 2003 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYS

3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICAT PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.

4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPRO (UDACS).

5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER T WITH LVVWD APPROVED SERVICE SADDLES.

6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.

7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS. THE LVVWD

8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.1 2003 EDITION OF THE UDACS.

9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYST

10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRA STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP

11. ANY INTERRUPTION OF SERVICE MUST BE APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR T SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.

12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD PRE-A MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALL ON THESE PLANS.

13. TELEPHONE "CALL BEFORE YOU DIG" AT 1-800-227-2600.

LAS VEGAS VALLEY WATER DISTRICT DATE

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING AND TRAFFIC DELINEATION SHALL CONFORM TO THE UNIFORM TRAFFIC DEVICES", LATEST EDITION.

2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM T DEPARTMENT PRIOR TO CONSTRUCTION.

3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL WARNING SIGNS FOR THE CONSTRUCTION ZONES. THE CONTRACTOR SHALL INSTALL TEMPORARY ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATE GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS

4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION W AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE C THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO

5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SI ON THE PLANS. STREET NAMES SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY S ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. AL SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.

7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROP SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON TH STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.

8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROV REGARDLESS OF TEH STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS BY THESE PLANS.

9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FO OF STREET NAME SIGNS.

10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE ATSSA TRAFFIC CONTROL T TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET-UP, MA REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHTS OF WAY.

11. WORK IN THE PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO TO THE TRAVELING PUBLIC

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BU SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.

13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIA UNIT (PHONE NO: 229-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CO FEES FOR THE USE OF THESE OFFICERS SHALL BE SET UP BY METRO AND WILL BE PAID BY T CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMETNS WITH METRO.

14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECT THE CITY OF LAS VEGAS TRAFFIC ENGINEER.

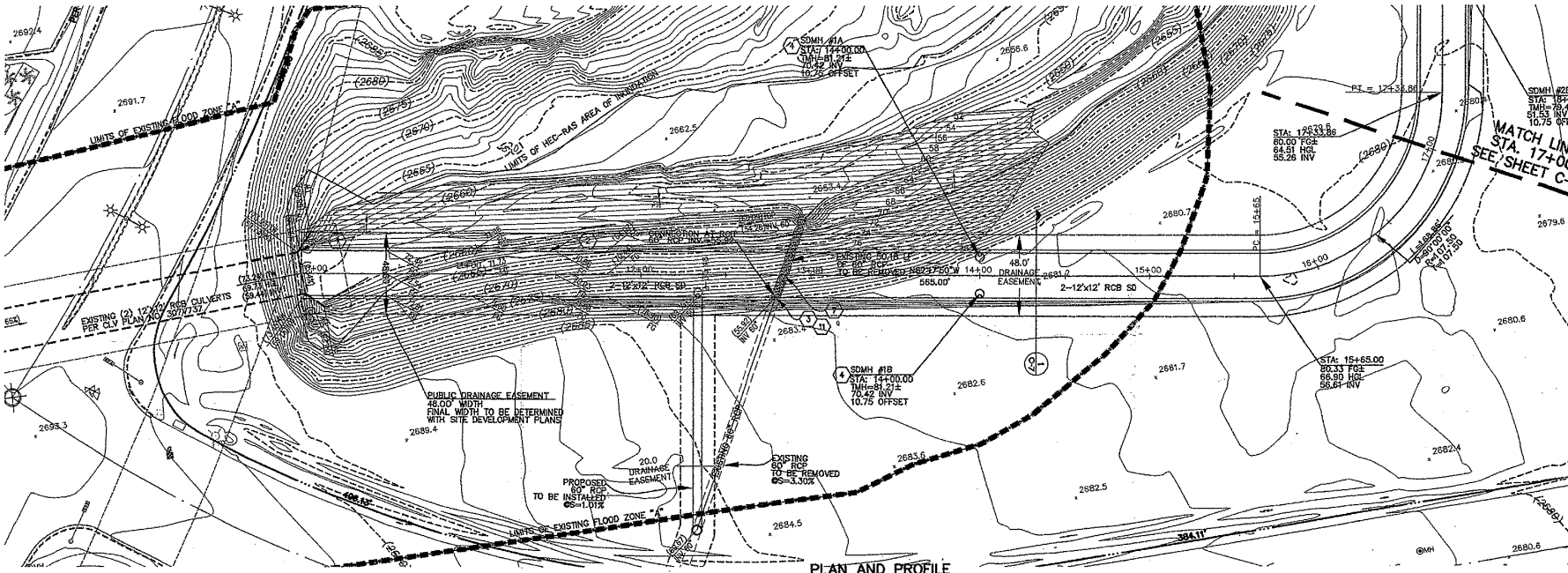
DEVIATION FROM STANDARDS

NONE – (PUBLIC)

BASIS OF BEARING

REPLY APP 0831


DETAIL 1
1"=20'
32+20.50
APN 138-29-801-002
EXISTING ANGEL PARK
PER CLV DWG. NO. 650.14
EXISTING ANGEL PARK RANCH II UNIT 4
PER CLV DWG. NO. 107Y-4289-4
APN 138-32-610/611/612/614
EXISTING ANGEL PARK RANCH UNIT 2
PER CLV DWG. NO. 107Y-4289
APN 138-32-201-003
EXISTING HOTEL/CASINO
PER CLV DWG. NO. 107-V3098
RAMPART BOULEVARD
(PUBLIC)
SHT. C-5
SHT. C-6

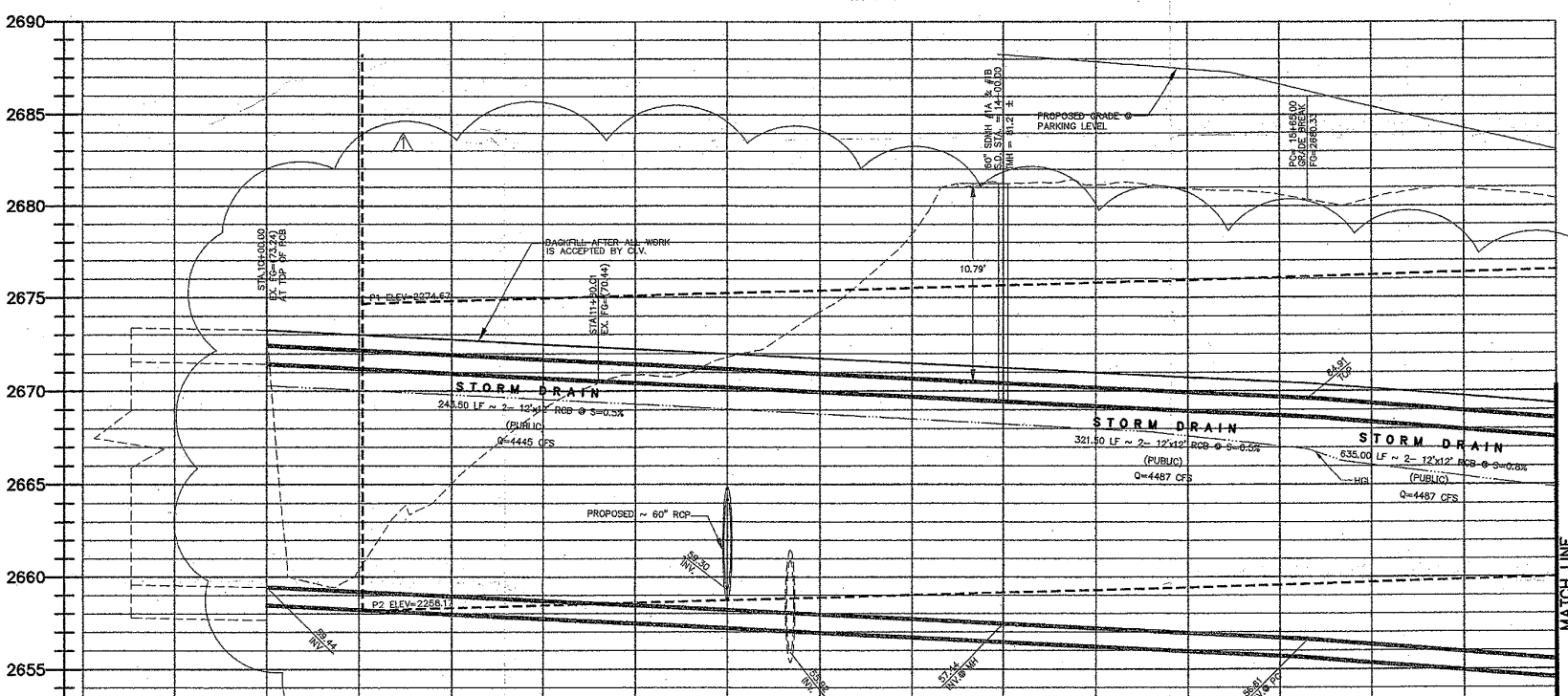


PLAN AND PROFILE

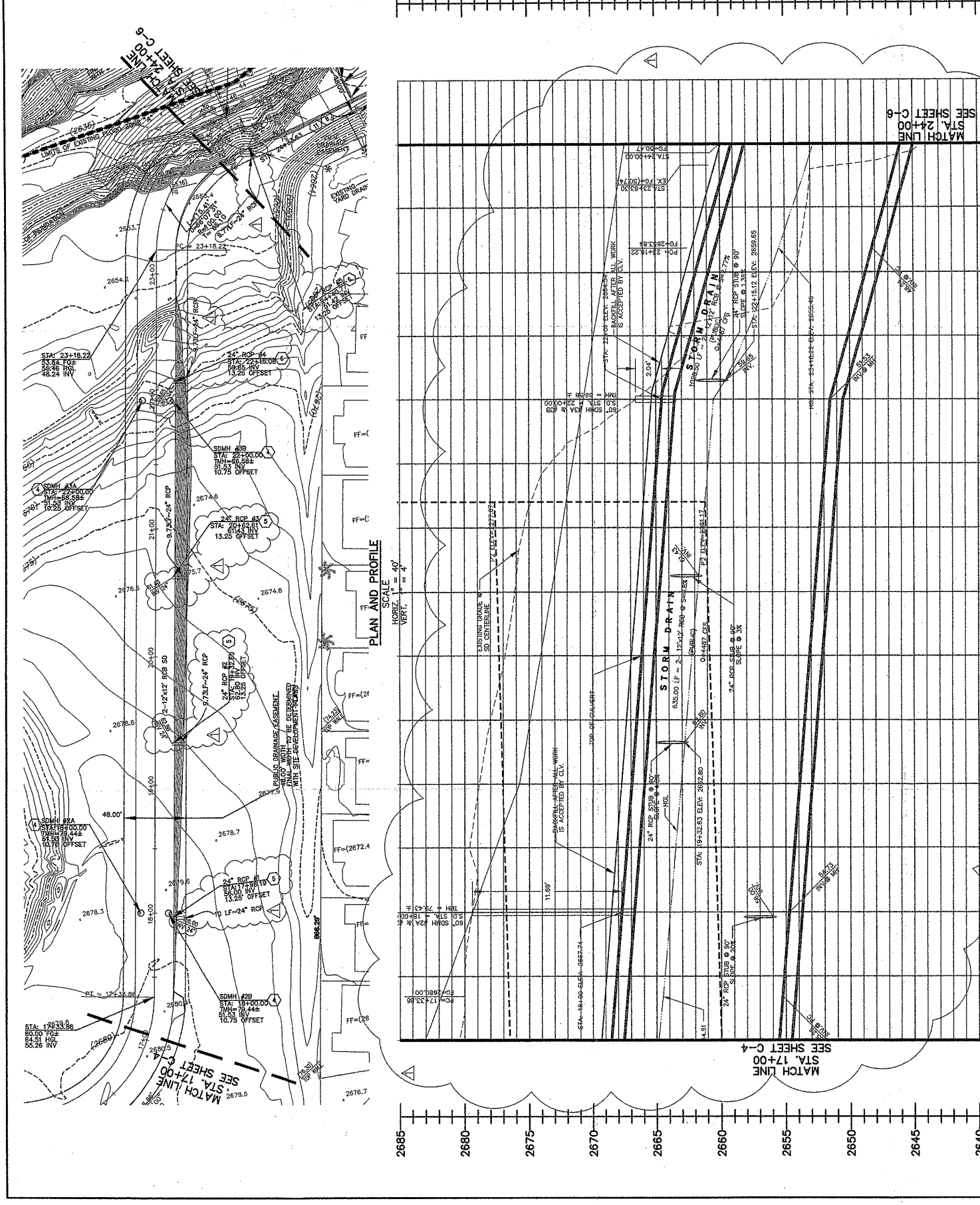
SCALE

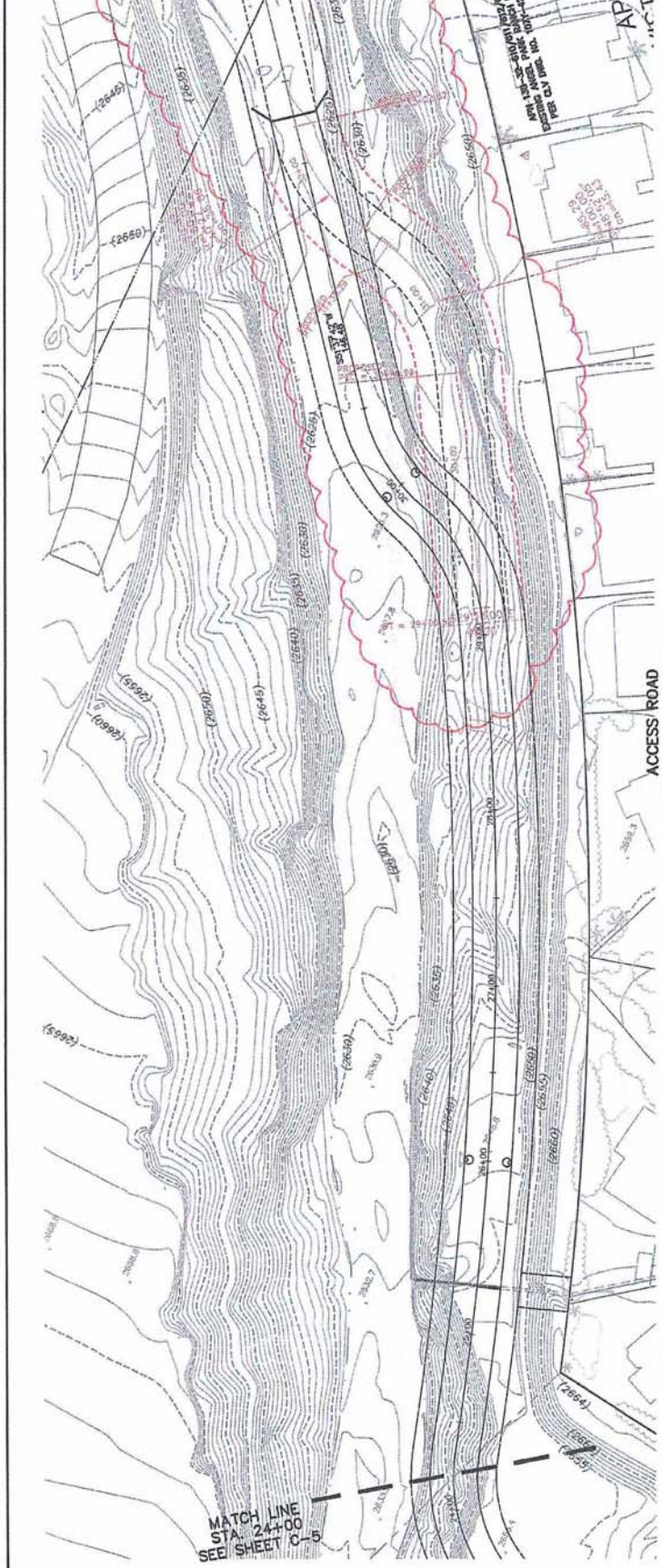
HORIZ. 1" = 40'

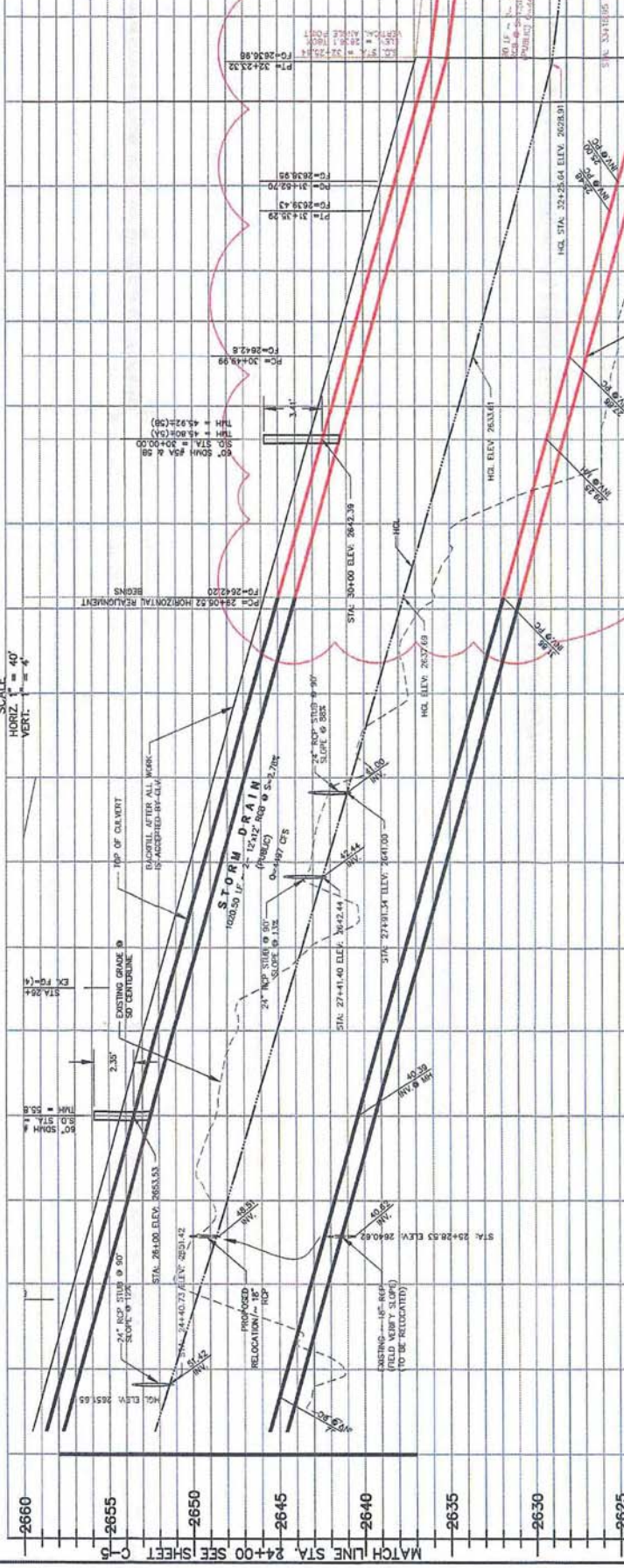
VERT. 1" = 4'

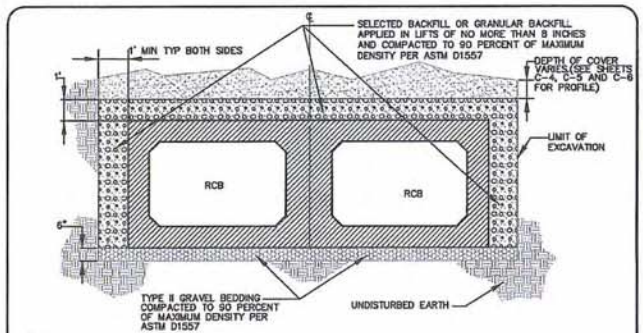


REPLY APP 0833


PLAN AND PROFILE
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'
STORM DRAIN
MATCH LINE
STA. 24+00
SEE SHEET C-6
MATCH LINE
STA. 17+00
SEE SHEET C-4
SDMH #2A
SDMH #2B
24" RCP #1
24" RCP #2
24" RCP #3
24" RCP #4
PUBLIC DRAINAGE EASEMENT
2685
2680
2675
2670
2665
2660
2655
2650
2645

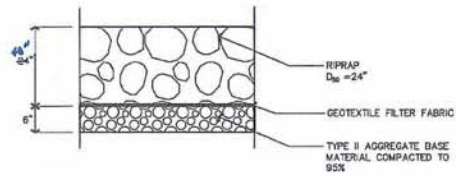

MATCH LINE
STA. 24+00
SEE SHEET C-5


ACCESS ROAD
PLAN AND PROFILE
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'
STORM DRAIN
MATCH LINE STA. 24+00 SEE SHEET C-5

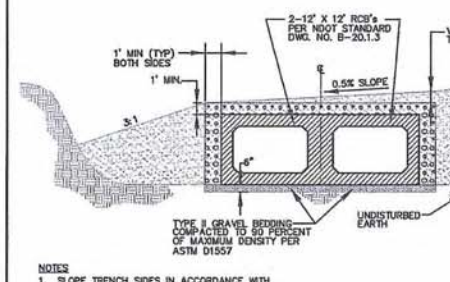


NOTES
1. SLOPE TRENCH SIDES IN ACCORDANCE WITH THE CLARK COUNTY STANDARD SPECIFICATIONS SECTION 208.03.01

TYPICAL RCB TRENCH SECTION (1)
NOT TO SCALE

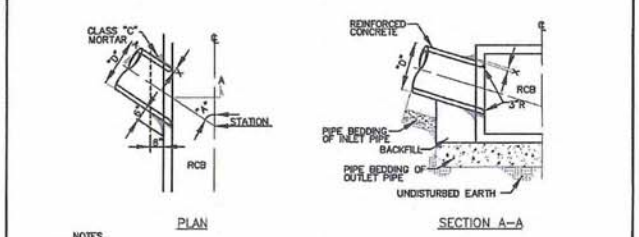


RIP RAP (B)
NOT TO SCALE



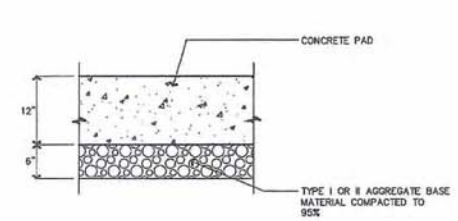
NOTES
1. SLOPE TRENCH SIDES IN ACCORDANCE WITH THE CLARK COUNTY STANDARD SPECIFICATIONS SECTION 208.03.01

RCB SECTION AT OUTLET
NOT TO SCALE

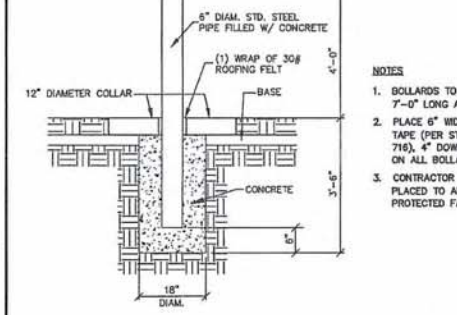


NOTES
1. ANGLE "A" SHALL BE BETWEEN 45° AND 90°.
2. DIMENSION "D" SHALL BE EQUAL TO OR LESS THAN 1/2 THE INSIDE DIAMETER OF THE MAINLINE PIPE.
3. DIMENSION "X" SHALL BE 1" MINIMUM AND 3" MAXIMUM.
4. BURN OR CHIP END OF INLET PIPE FLUSH WITH INNER SURFACE OF MAINLINE PIPE, ROUND EDGES OF MAINLINE AND INLET PIPES.
5. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL REINFORCEMENT IN RCB WALL.

PIPE TO RCB JUNCTION STRUCTURE DETAIL (2)
NOT TO SCALE

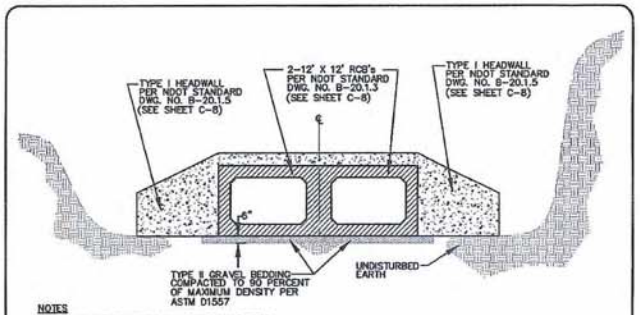


CONCRETE PAD (C)
NOT TO SCALE



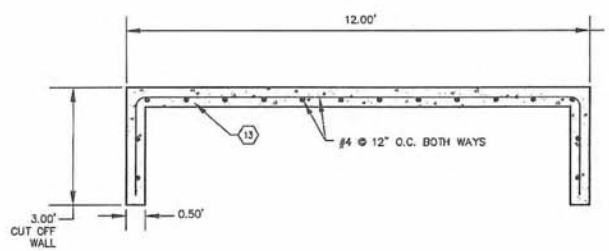
NOTES
1. BOLLARDS TO
7'-0" LONG
2. PLACE 6" WID
TAPE (PER ST
716). 4" DOW
ON ALL BOLL
3. CONTRACTOR
PLACED TO A
PROTECTED F

BOLLARD POLE DETAIL (D)
NOT TO SCALE

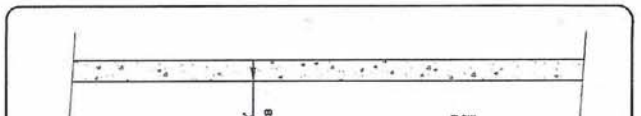


NOTES
1. SLOPE TRENCH SIDES IN ACCORDANCE WITH THE CLARK COUNTY STANDARD SPECIFICATIONS SECTION 208.03.01

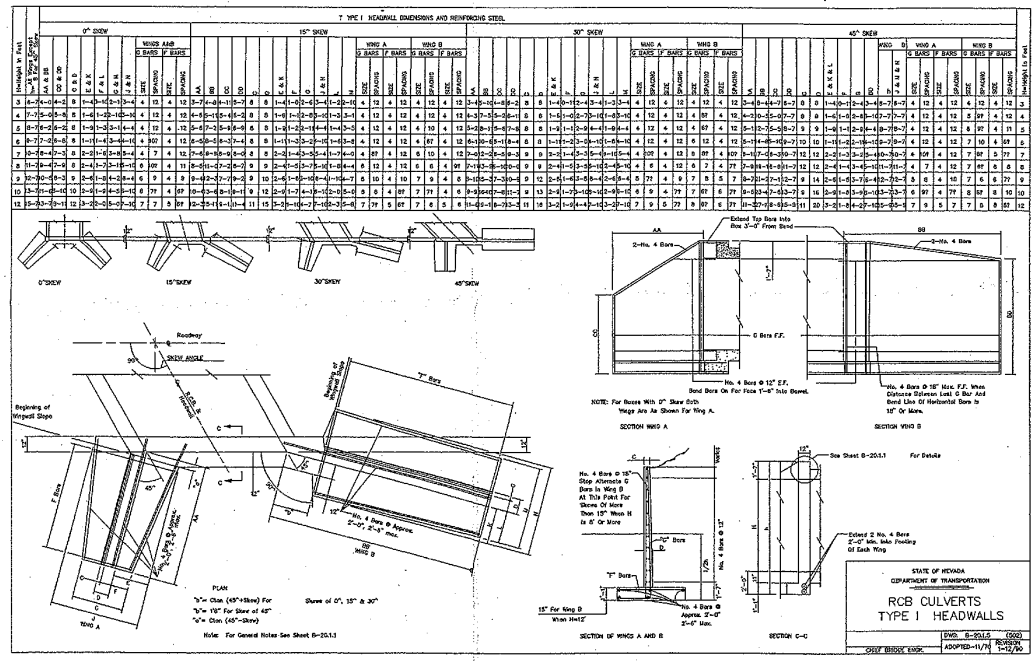
HEADWALL DETAIL (3)
NOT TO SCALE

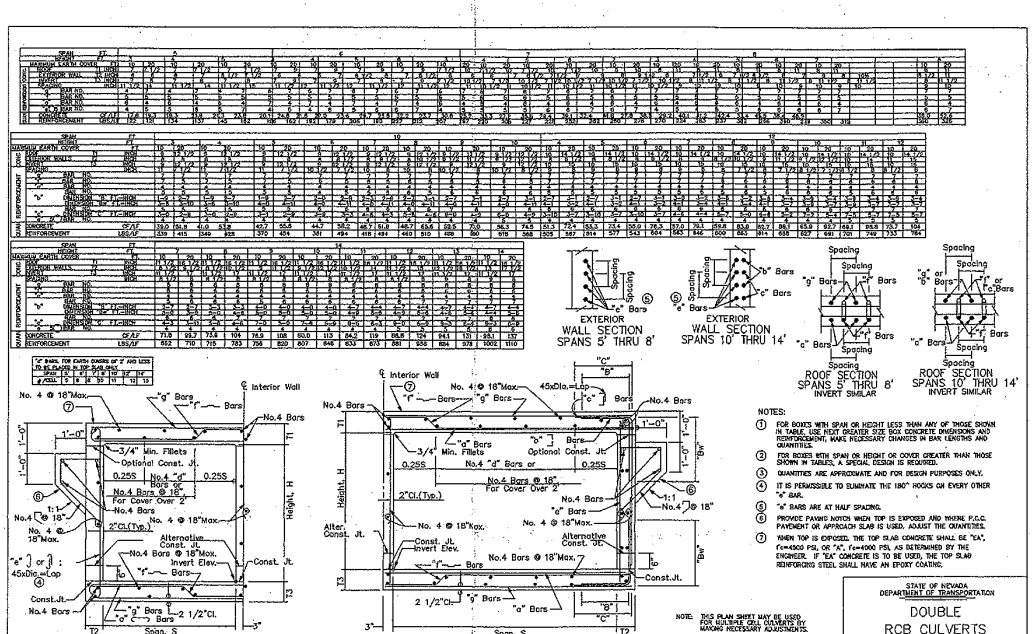


ACCESS ROAD DETAIL (E)
NOT TO SCALE

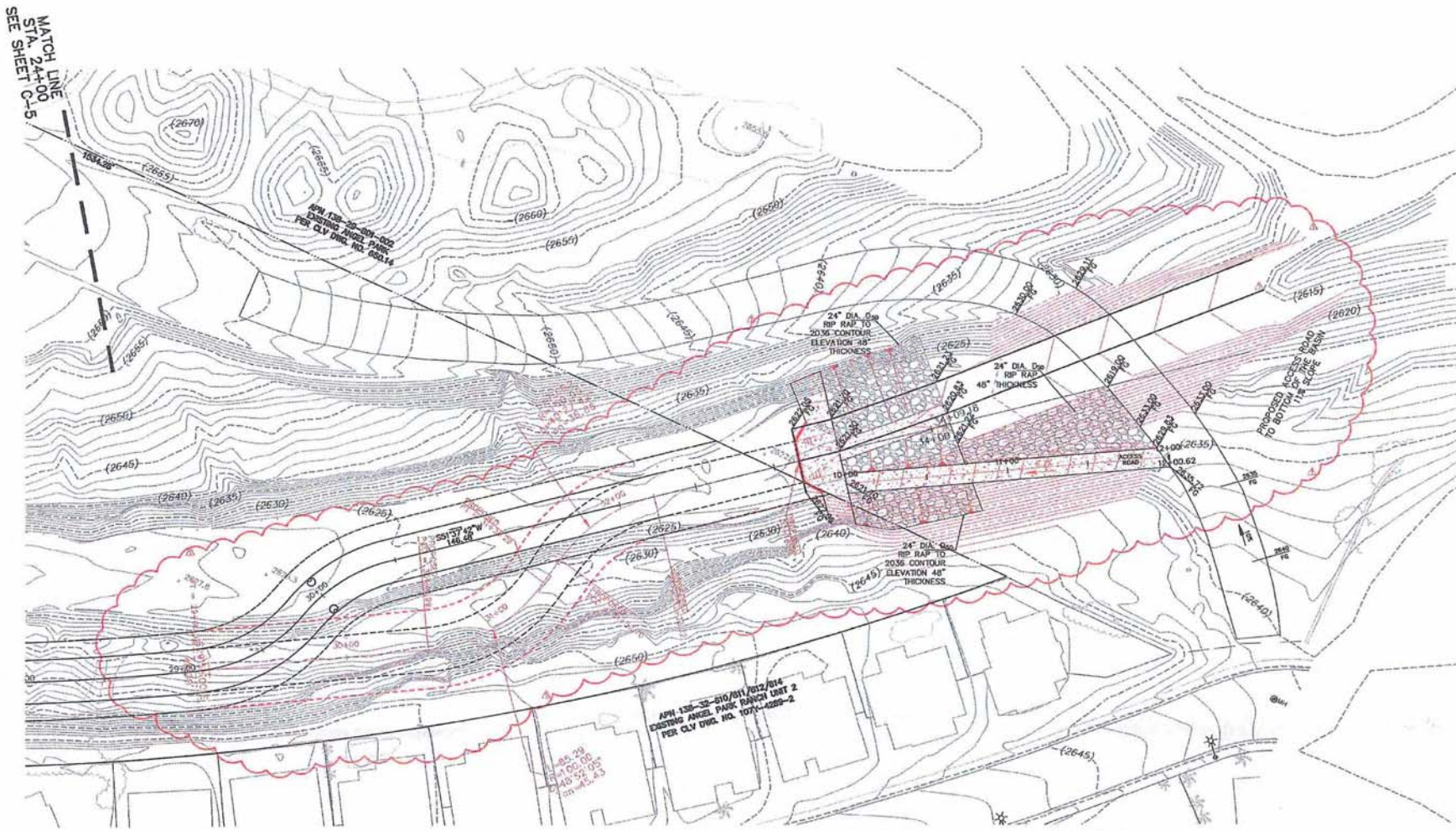


REPLY APP 0836



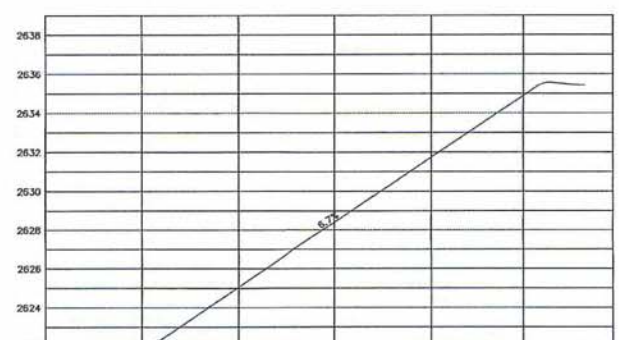


REPLY APP 0837



ACCESS ROAD
PLAN AND PROFILE

SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



GRADING CONSTRUCTION NOTES

1. CONTRACTOR TO MATCH TO EXISTING 2-12'x12' RCB CULVERT.
2. CONSTRUCT 2-12'x12' RCB CULVERT PER NDOT DETAIL D-20.1.3 & TRENCH RCB SECTION PER DETAIL 1, SHEET C-7.
3. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 60" RCP.
4. INSTALL 60" STORM DRAIN MANHOLE PER CLARK COUNTY STANDARD DRAWING #401.
5. INSTALL 24" CLASS V RCP STUB PER DETAIL 2, SHEET C-7.
6. INSTALL 24" CLASS IV RCP STUB PER DETAIL 2, SHEET C-7.
7. INSTALL EQUALIZATION CHAMBER PER DETAIL A, SHEET C-7.
8. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 18" RCP.
9. CONSTRUCT RCB CULVERT TYPE I

```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998              *                                                    *   HYDROLOGIC ENGINEERING CENTER      *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   23JUN08  TIME  10:11:08  *                                                    *          (916) 756-1104              *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************


                                                X     X  XXXXXXX   XXXXX          X
                                                X     X  X        X     X        XX
                                                X     X  X        X              X
                                                XXXXXXX  XXXX     X       XXXXX  X
                                                X     X  X        X              X
                                                X     X  X        X     X        X
                                                X     X  XXXXXXX   XXXXX        XXX


          THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

          THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
          THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
          NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
          DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
          KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                                   HEC-1 INPUT                                                          PAGE  1

          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

                        *DIAGRAM

 *** FREE ***
             1          ID    CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT 2008 MASTER PLAN UPDATE
             2          ID    GOWAN WATERSHED (ALL)
             3          ID    RECOMMENDED DRAINAGE SYSTEM WITH ULTIMATE DEVELOPMENT
             4          ID    INPUT FILE = ALLGOW3.DAT
             5          ID    INPUT FILE DATE = MAY 5, 2008
             6          ID    DESIGN STORM = 100-YEAR 6-HR STORM
             7          ID    STORM DISTRIBUTION = SDN #3
             8          ID    MODELED BY PBS&J (MICHELE L. D'ALESSANDRO, E.I., CFM)
             9          ID    CHECKED BY PBS&J (HARSHAL B. DESAI, P.E., CFM)
            10          ID    STORM CENTERING = FULL WATERSHED
            11          ID
            12          ID    REFERENCED HYDROLOGIC MODELS:
            13          ID    CITY OF LAS VEGAS CITY WIDE HYDROLOGY ANALYSIS (PBS&J 1997)
            14          ID    NORTHWEST NEIGHBORHOOD STUDY PHASE 1 (PBS&J 1997)
            15          ID    RESPONSE TO COMMENTS ON THE 2006 SUMMERLIN WEST PLANNING AREA FLOOD
            16          ID    CONTROL MASTER PLAN UPDATE (G.C. WALLACE 2006)
            17          ID    3RD RESPONSE TO COMMENTS ON THE 2006 SUMMERLIN WEST PLANNING AREA FLOOD
            18          ID    CONTROL MASTER PLAN UPDATE (G.C. WALLACE 2006)
            19          ID    SUPPLEMENT FOR THE 2006 SUMMERLIN WEST PLANNING AREA FLOOD CONTROL
            20          ID    MASTER PLAN UPDATE (G.C. WALLACE 2006)
            21          ID    GOWAN OUTFALL - LONE MOUNTAIN BRANCH PRELIMINARY DESIGN REPORT
            22          ID    (G.C. WALLACE 2007)
            23          ID    LONE MOUNTAIN WESTERN BELTWAY DETENTION BASIN PARAMETERS (RECEIVED
            24          ID    FROM G.C. WALLACE ON JANUARY 31, 2008)
            25          ID    US 95/RANCHO FIS RESTUDY (PBS&J 1998)
            26          ID    JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
            27          ID
            28          ID                          AREA    DARF
            29          ID                          SQ. MI.
            30          ID                          0-0.5   0.99
            31          ID                          0.5-1   0.975
            32          ID                          1-2     0.95
            33          ID                          2-3     0.925
            34          ID                          3-4     0.915
            35          ID                          4-5     0.908
            36          ID                          5-6     0.903
            37          ID                          6-7     0.895
            38          ID                          7-8     0.885
            39          ID
            40          ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
            41          ID
            42          ID  100-YEAR,  6-HOUR STORM,  SDN3
            43          ID
            44          IT       5       0       0     650
            45          IO       5       0       0
            46          IN       5       0       0
            47          JR    PREC    0.99   0.975    0.95   0.925   0.915   0.908   0.903   0.895   0.885
                        *
1                                                   HEC-1 INPUT                                                          PAGE  2

          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


            48          KK  LV29-C
            49          BA   0.277
            50          PB    2.80
            51          PC      0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13    0.13
            52          PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
            53          PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
            54          PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            55          PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            56          PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
            57          PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
            58          PC   0.998   0.999       1
            59          LS       0    90.6
            60          UD   0.409
                        *

            61          KK RLV29-C
            62          KM  ROUTE LV29-C TO CLV30-C
            63          KM  FACILITY = GOWAN - TENAYA BRANCH
            64          KM  FACILITY # = GOTE 0000
```

```
1850          KM  CONVERTED TO MUSKINGUM-CUNGE TO ACHIEVE STABILITY
1851          RD    1559    0.02    0.04       0    TRAP     100       3
              *
```


Begin Reference

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.......10

1852          KK    SW11
1853          BA   0.589
1854          PB    3.34
1855          LS       0     87.8
1856          UD   0.311
              *

1857          KK    RSW11
1858          KM  ROUTE SW11 TO CSW17
1859          KM  FACILITY = ANGEL PARK - CHARLESTON BOULEVARD
1860          KM  FACILITY # = APCB 0064, 0080
1861          KM  LINING = RCB
1862          RD    2338  0.0167   0.015       0    TRAP       7       0
              *

1863          KK    SW17
1864          BA   0.356
1865          PB    3.30
1866          LS       0     87.8
1867          UD   0.271
              *

1868          KK    CSW17
1869          KM  COMBINE RSW11 AND SW17
1870          HC       2
              *

1871          KK  RCSW17
1872          KM  ROUTE CSW17 TO CSW18
1873          KM  FACILITY = ANGEL PARK - CHARLESTON BOULEVARD
1874          KM  FACILITY # = APCB 0000,0001,0019,0050
1875          KM  LINING = RCB
1876          RD    3600   0.014   0.015       0    TRAP      11       0
              *

1877          KK    SW18
1878          BA   0.405
1879          PB    3.27
1880          LS       0     86.8
1881          UD   0.271
              *

1882          KK    CSW18
1883          KM  COMBINE RCSW17 AND SW18
1884          HC       2
              *

1885          KK  RCSW18
1886          KM  ROUTE CSW18 TO C12A
1887          KM  FACILITY = ANGEL PARK SOUTH
1888          KM  FACILITY # = APSO 0254,0255,0258,0345,0346; APCB 0000
1889          KM  NATURAL WASH
1890          KM  LENGTH = 5,200
1891          KM  SLOPE = 1.4%
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.......10

1892          KM  N = 0.040
1893          KM  HYDRAULIC RADIUS = 1.5
1894          KM  VELOCITY =  9.2
1895          RM       2   0.157    0.15
              *

1896          KK     12A
1897          BA   0.392
1898          PB    3.20
1899          LS       0     91.2
1900          UD   0.264
              *

1901          KK    C12A
1902          KM  COMBINE 12A AND RCSW18
1903          HC       2
              *

1904          KK    RC12A
1905          KM  ROUTE THRU 12B
1906          KM  FACILITY = ANGEL PARK SOUTH
1907          KM  FACILITY # = APSO 0204, 0205
1908          KM  NATURAL WASH
1909          KM  LENGTH = 2,600
1910          KM  SLOPE = 3.5%
1911          KM  N = 0.040
1912          KM  HYDRAULIC RADIUS = 1.5
1913          KM  VELOCITY = 14.5
1914          RM       1    0.05    0.15
              *

1915          KK     12B
1916          BA   0.260
1917          PB    3.13
1918          LS       0     91.0
1919          UD   0.233
              *

1920          KK    C12B
1921          KM  COMBINE 12B AND RC12A
1922          HC       2
              *

1923          KK    RC12B
1924          KM  ROUTE C12B TO C57B-3
1925          KM  FACILITY = ANGEL PARK SOUTH
```

```
1926          KM  FACILITY # = APSO 0067
1927          KM  NATURAL WASH
1928          KM  LENGTH = 6,000
1929          KM  SLOPE = 2.3%
1930          KM  N = 0.040
1931          KM  HYDRAULIC RADIUS = 1.5
1932          KM  VELOCITY =  11.8
1933          RM       2   0.141    0.15
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1934          KK   57B-3
1935          BA   0.310
1936          PB    3.04
1937          LS       0     82.1
1938          UD   0.332
              *

1939          KK  C57B-3
1940          KM  COMBINE RC12B AND 57B-3
1941          HC       2
              *

1942          KK RC57B-3
1943          KM  ROUTE C57B-3 TO C57B-2
1944          KM  FACILITY = ANGEL PARK SOUTH
1945          KM  FACILITY # = APSO 0067
1946          KM  NATURAL WASH
1947          KM  LENGTH = 1,300
1948          KM  SLOPE = 1.7%
1949          KM  N = 0.040
1950          KM  HYDRAULIC RADIUS = 1.5
1951          KM  VELOCITY =  10.2
1952          RM       0   0.035    0.15
              *

1953          KK   57B-2
1954          BA   0.362
1955          PB    3.02
1956          LS       0     84.1
1957          UD   0.332
              *

1958          KK  C57B-2
1959          KM  COMBINE 57B-2 AND RC57B-3
1960          HC       2
              *

1961          KK RC57B-2
1962          KM  ROUTE C57B-2 TO CC57B-1
1963          KM  FACILITY = ANGEL PARK SOUTH
1964          KM  FACILITY # = APSO 0067
1965          KM  NATURAL WASH
1966          KM  LENGTH = 1,000
1967          KM  SLOPE = 1.8%
1968          KM  N = 0.040
1969          KM  HYDRAULIC RADIUS = 1.5
1970          KM  VELOCITY =  10.5
1971          RM       0   0.027    0.15
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1972          KK   13B-1
1973          BA   0.249
1974          PB    3.19
1975          LS       0     91.6
1976          UD   0.284
              *

1977          KK RC13B-1
1978          KM  ROUTE 13B-1 TO C13B-2
1979          KM  GRIFFITH PARK DRIVE AND HUALAPAI WAY
1980          RD    3000   0.018   0.016       0    TRAP       0      50
              *

1981          KK   13B-2
1982          BA   0.216
1983          PB    3.14
1984          LS       0     89.7
1985          UD   0.231
              *

1986          KK  C13B-2
1987          KM  COMBINE 13B-2 AND RC13B-1
1988          KM  HUALAPAI WAY AND LOCAL FACILITY
1989          HC       2
              *

1990          KK RC13B-2
1991          KM  ROUTE C13B-2 TO CCPIC-A
1992          KM  LINING = GRASS
1993          RD    4900   0.021    0.03       0    TRAP      40       6
              *

1994          KK     19A
1995          BA   0.253
1996          PB    3.25
1997          LS       0     89.9
1998          UD   0.351
              *

1999          KK    R19A
2000          KM  ROUTE 19A TO C13A-1
2001          KM  UNNAMED ROAD
2002          RD    4300   0.021   0.016       0    TRAP       0      50
              *
```

```
2003          KK   13A-1
2004          BA   0.224
2005          PB    3.19
2006          LS       0     91.4
2007          UD   0.302
              *
1                                        HEC-1 INPUT                                                PAGE 54

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

2008          KK  C13A-1
2009          KM  COMBINE 13A-1 AND R19A
2010          KM  TOWN CENTER DRIVE AND SWALE
2011          HC       2
              *

2012          KK RC13A-1
2013          KM  ROUTE C13A-1 TO C13A-2
2014          KM  NATURAL WASH
2015          KM  TRAVEL LENGTH = 2,800
2016          KM  SLOPE = 2.1%
2017          KM  N = 0.040
2018          KM  HYDRAULIC RADIUS = 1.5
2019          KM  VELOCITY = 11.4
2020          RM       1   0.068    0.15
              *

2021          KK   13A-2
2022          BA   0.188
2023          PB    3.15
2024          LS       0     90.0
2025          UD   0.236
              *

2026          KK  C13A-2
2027          KM  COMBINE 13A-2 AND RC13A-1
2028          HC       2
              *

2029          KK RC13A-2
2030          KM  ROUTE C13A-2 TO CPIC-C
2031          KM  LINING = GRASS
2032          RD    5200   0.015    0.03       0    TRAP      40       4
              *

2033          KK   PIC-C
2034          BA   0.243
2035          PB    3.08
2036          LS       0     90.4
2037          UD   0.373
              *

2038          KK  CPIC-C
2039          KM  COMBINE PIC-C AND RC13A-2
2040          HC       2
              *

2041          KK RCPIC-C
2042          KM  ROUTE CPIC-C TO CPIC-A
2043          KM  LINING = GRASS
2044          RD    2200   0.025    0.03       0    TRAP      40       4
              *
1                                        HEC-1 INPUT                                                PAGE 55

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

2045          KK   PIC-A
2046          BA   0.359
2047          PB    3.03
2048          LS       0     91.1
2049          UD   0.499
              *

2050          KK  CPIC-A
2051          KM  COMBINE RCPIC-C AND PIC-A
2052          HC       2
              *

2053          KK CCPIC-A
2054          KM  COMBINE CPIC-A AND RC13B-2
2055          HC       2
              *

2056          KKRCCPIC-A
2057          KM  ROUTE CCPIC-A TO C57B-1
2058          KM  FACILITY = ANGEL PARK - PECCOLE 2
2059          KM  FACILITY # = APP2 0000
2060          KM  LINING = GRASS
2061          RD    4793   0.021    0.03       0    TRAP      10       2
              *

2062          KK   57B-1
2063          BA   0.197
2064          PB    2.92
2065          LS       0     85.5
2066          UD   0.277
              *

2067          KK  C57B-1
2068          KM  COMBINE 57B-1 AND RCCPIC-A
2069          HC       2
              *

2070          KK CC57B-1
2071          KM  COMBINE C57B-1 AND RC57B-2
2072          HC       2
              *

2073          KKRCC57B-1
```

```
2074          KM  ROUTE CC57B-1 TO C57B-4
2075          KM  FACILITY = ANGEL PARK - SOUTH BRANCH
2076          KM  FACILITY # = APSO 0050
2077          KM  LINING = NATURAL WASH
2078          RD     300  0.0184    0.04        0    TRAP     100       3
              *
1                                          HEC-1 INPUT                                                          PAGE 56

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

2079          KK   57B-4
2080          BA   0.200
2081          PB    2.91
2082          LS       0     90.0
2083          UD   0.233
              *

2084          KK  C57B-4
2085          KM  COMBINE RCC57B-1 AND 57B-4
2086          HC       2
              *

2087          KK   PIC-B
2088          BA   0.441
2089          PB    2.98
2090          LS       0     91.1
2091          UD   0.471
              *

2092          KK  RPIC-B
2093          KM  ROUTE PIC-B TO CC57B-4
2094          KM  FACILITY = ANGEL PARK - PECCOLE 1
2095          KM  FACILITY # = APP1 0000
2096          KM  LINING = RCP
2097          RD    2982   0.024   0.013        0    CIRC       6
              *

2098          KK CC57B-4
2099          KM  COMBINE RPIC-B AND C57B-4
2100          HC       2
              *

END PACKAGE
2101          KKRCC57B-4
2102          KM  ROUTE CC57B-4 TO ANGLPKIN
2103          KM  FACILITY = ANGEL PARK SOUTH
2104          KM  FACILITY # = APSO 0000, 0020
2105          KM  LINING = RCB
2106          RD    2857  0.0162   0.015        0    TRAP      24       0
              *

2107          KK     38A
2108          BA   0.353
2109          PB    2.86
2110          LS       0     91.6
2111          UD   0.399
              *

2112          KK    R38A
2113          KM  ROUTE 38A TO C38B
2114          KM  FACILITY = ANGEL PARK - DURANGO
2115          KM  FACILITY # = APDG 0000,0060
2116          KM  LINING = RCP
2117          RD    4500  0.0096   0.015        0    CIRC       6
              *
1                                          HEC-1 INPUT                                                          PAGE 57

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

2118          KK     38B
2119          BA   0.440
2120          PB    2.82
2121          LS       0     92.9
2122          UD   0.375
              *

2123          KK    C38B
2124          KM  COMBINE 38B AND R38A
2125          KM  DUCHARME AND DURANGO
2126          HC       2
              *

2127          KK    57BA
2128          BA   0.317
2129          PB    2.96
2130          LS       0     78.2
2131          UD   0.436
              *

2132          KK   R57BA
2133          KM  ROUTE 57BA TO C3C
2134          KM  RAMPART BOULEVARD
2135          RD     500    0.02   0.016        0    TRAP       0      50
              *

2136          KK      3C
2137          BA   0.153
2138          PB    2.90
2139          LS       0     93.1
2140          UD   0.246
              *

2141          KK     C3C
2142          KM  COMBINE 3C AND R57BA
2143          KM  RAMPART AND REGENT LAS VEGAS
2144          HC       2
              *

2145          KK    RC3C
2146          KM  ROUTE C3C TO ANGLPKIN
2147          KM  LINING = UNLINED
```

```
1837          SF2-C
1842   CSF2-C............
                 V
                 V
1845  RCSF2-C
1852          * SW11
                 V
                 V
1857          RSW11
1863                     SW17
1868          CSW17............
                 V
                 V
1871          RCSW17
1877                     SW18
1882          CSW18............
                 V
                 V
1885          RCSW18
1896                     12A
1901          C12A............
                 V
                 V
1904          RC12A
1915                     12B
1920          C12B............
                 V
                 V
1923          RC12B
1934                     57B-3
1939          C57B-3............
                 V
                 V
1942          RC57B-3
1953                     57B-2
1958          C57B-2............
                 V
                 V
1961          RC57B-2
1972                     13B-1
                            V
                            V
1977                   RC13B-1
1981                            13B-2
1986                   C13B-2............
                            V
                            V
1990                   RC13B-2
1994                                19A
                                     V
                                     V
1999                                R19A
2003                                        13A-1
2008                            C13A-1............
                                     V
                                     V
2012                            RC13A-1
2021                                        13A-2
2026                            C13A-2............
                                     V
                                     V
2029                            RC13A-2
2033                                        PIC-C
```

Begin Reference

```
                                        ALLGOW3.OUT
2038                                          CPIC-C............
                                                 V
2041                                          RCPIC-C
                                                 .
2045                                                        PIC-A
                                                 .            .
2050                                          CPIC-A............
                                                 .
2053                                       CCPIC-A............
                                              V
2056                                       RCCPIC-A
                                              .
2062                                            57B-1
                                              .
2067                                       C57B-1............
                                              .
2070                                 CC57B-1............
                                        V
2073                                 RCC57B-1
                                        .
2079                                       57B-4
                                              .
2084                                  C57B-4............
                                        .
2087                                       PIC-B
                                              V
2092                                       RPIC-B
                                              .
2098                                 CC57B-4............
                                        V
2101                                 RCC57B-4
                                        .
2107                                       38A
                                              V
2112                                       R38A
                                              .
2118                                            38B
                                              .
2123                                       C38B............
                                              .
2127                                            57BA
                                                 V
2132                                            RS7BA
                                              .
2136                                                        3C
                                              .            .
2141                                            C3C............
                                                 V
2145                                            RC3C
                                              .
2150                                                        AP
                                              .            .
2155                          ANGLPKIN.......................................
                                 V
2160                          ANGLPKDB
                                 V
2181                          ANGLPKOT
                                 .
2187                                 GD34AB
                                        .
2192                           CGD34AB............
                                 V
2196                          RCGD34AB
                                 .
2202                                 GD34AC
                                        .
2207                           CGD34AC............
                                 .
2211                   CCGD34AC............
                          V
2216                   RCGD34AC
                          .
2222                          K-C
                                 .
2233                                 -------> DCHEY
```

Page 60

* End Reference

+ 2 COMBINED AT	C8B-1	1.14	1	FLOW	1246.	1219.	1173.	1128.	1111.	1098.	1089.	1075.	1056.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ ROUTED TO	RC8B-1	1.14	1	FLOW	1222.	1195.	1152.	1110.	1090.	1081.	1071.	1055.	1040.
				TIME	3.83	3.75	3.83	3.83	3.83	3.83	3.83	3.83	3.83
+ HYDROGRAPH AT	8B-2	.42	1	FLOW	574.	564.	547.	530.	523.	518.	515.	510.	503.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ 2 COMBINED AT	C8B-2	1.56	1	FLOW	1795.	1758.	1697.	1632.	1610.	1593.	1578.	1562.	1533.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ ROUTED TO	RC8B-2	1.56	1	FLOW	1774.	1736.	1681.	1618.	1593.	1582.	1565.	1547.	1522.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
+ HYDROGRAPH AT	11A-2	.29	1	FLOW	433.	424.	409.	394.	388.	384.	381.	376.	370.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
+ ROUTED TO	R11A-2	.29	1	FLOW	422.	413.	393.	378.	372.	368.	365.	360.	354.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
+ HYDROGRAPH AT	8A	.31	1	FLOW	384.	375.	361.	347.	341.	337.	335.	330.	324.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
+ 2 COMBINED AT	C8A	.60	1	FLOW	805.	788.	755.	725.	713.	705.	700.	690.	679.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
+ ROUTED TO	RC8A	.60	1	FLOW	751.	734.	704.	675.	664.	657.	651.	643.	632.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ HYDROGRAPH AT	3B-2A	.24	1	FLOW	329.	322.	311.	300.	295.	292.	290.	286.	282.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
+ 2 COMBINED AT	C3B-2A	.84	1	FLOW	1040.	1018.	977.	939.	924.	914.	907.	895.	880.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ 2 COMBINED AT	CC3B-2A	2.40	1	FLOW	2803.	2743.	2644.	2540.	2505.	2476.	2453.	2428.	2384.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ ROUTED TO	RCC3B-2A	2.40	1	FLOW	2769.	2725.	2623.	2515.	2493.	2463.	2431.	2413.	2367.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
+ HYDROGRAPH AT	3B-2B	.27	1	FLOW	271.	265.	254.	244.	240.	237.	235.	231.	227.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ 2 COMBINED AT	C3B-2B	2.67	1	FLOW	3025.	2975.	2863.	2746.	2720.	2687.	2653.	2632.	2582.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
+ 2 COMBINED AT	CC3B-2B	14.42	1	FLOW	10916.	10721.	10381.	10032.	9913.	9809.	9738.	9637.	9486.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
+ ROUTED TO	RCC3B-2B	14.42	1	FLOW	10822.	10623.	10284.	9931.	9814.	9701.	9639.	9527.	9379.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
+ HYDROGRAPH AT	SF2-C	.39	1	FLOW	294.	287.	275.	263.	259.	255.	253.	249.	245.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
+ 2 COMBINED AT	CSF2-C	14.81	1	FLOW	11116.	10909.	10559.	10195.	10073.	9957.	9891.	9776.	9623.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
+ ROUTED TO	RCSF2-C	14.81	1	FLOW	11007.	10789.	10429.	10061.	9937.	9831.	9758.	9650.	9507.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	4.00	4.00	4.00
+ HYDROGRAPH AT	SW11	.59	1	FLOW	759.	743.	717.	691.	680.	673.	668.	660.	649.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ ROUTED TO	RSW11	.59	1	FLOW	754.	738.	712.	686.	676.	668.	663.	655.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ HYDROGRAPH AT	SW17	.36	1	FLOW	479.	469.	452.	436.	429.	424.	421.	416.	409.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
+ 2 COMBINED AT	CSW17	.94	1	FLOW	1221.	1196.	1153.	1111.	1095.	1083.	1075.	1061.	1044.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ ROUTED TO	RCSW17	.94	1	FLOW	1211.	1186.	1143.	1101.	1083.	1073.	1063.	1051.	1035.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
+ HYDROGRAPH AT	SW18	.41	1	FLOW	519.	507.	489.	470.	463.	457.	454.	448.	440.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
+ 2 COMBINED AT	CSW18	1.35	1	FLOW	1718.	1682.	1622.	1562.	1537.	1521.	1508.	1490.	1467.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75

begin Reference

ROUTED TO +	RCSW18	1.35	1	FLOW	1610.	1576.	1520.	1464.	1441.	1426.	1414.	1397.	1375.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	12A	.39	1	FLOW	576.	565.	547.	529.	521.	516.	513.	507.	500.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	C12A	1.74	1	FLOW	2046.	2003.	1932.	1861.	1832.	1813.	1798.	1776.	1748.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	RC12A	1.74	1	FLOW	2025.	1983.	1913.	1843.	1815.	1796.	1782.	1760.	1732.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	12B	.26	1	FLOW	387.	380.	367.	355.	350.	347.	344.	340.	335.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	C12B	2.00	1	FLOW	2259.	2212.	2134.	2056.	2024.	2002.	1987.	1962.	1931.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	RC12B	2.00	1	FLOW	2194.	2148.	2073.	1998.	1967.	1946.	1931.	1907.	1877.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	57B-3	.31	1	FLOW	267.	260.	248.	237.	233.	230.	227.	224.	219.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT +	C57B-3	2.31	1	FLOW	2394.	2344.	2261.	2177.	2144.	2120.	2104.	2077.	2044.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO +	RC57B-3	2.31	1	FLOW	2375.	2325.	2242.	2158.	2125.	2101.	2085.	2058.	2025.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	57B-2	.36	1	FLOW	338.	329.	316.	302.	297.	293.	291.	286.	281.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT +	C57B-2	2.67	1	FLOW	2626.	2570.	2477.	2384.	2347.	2321.	2302.	2273.	2236.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO +	RC57B-2	2.67	1	FLOW	2609.	2553.	2460.	2367.	2330.	2304.	2285.	2256.	2219.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	13B-1	.25	1	FLOW	354.	347.	336.	325.	321.	318.	315.	312.	307.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO +	RC13B-1	.25	1	FLOW	354.	347.	336.	324.	320.	317.	314.	311.	307.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.83	3.83	3.83
HYDROGRAPH AT +	13B-2	.22	1	FLOW	310.	304.	294.	283.	279.	277.	274.	271.	267.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	C13B-2	.47	1	FLOW	634.	622.	602.	581.	573.	567.	563.	557.	549.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO +	RC13B-2	.47	1	FLOW	641.	628.	607.	586.	578.	572.	568.	561.	553.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT +	19A	.25	1	FLOW	318.	312.	301.	291.	287.	284.	282.	278.	274.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO +	R19A	.25	1	FLOW	319.	313.	302.	292.	288.	285.	283.	280.	276.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	13A-1	.22	1	FLOW	308.	303.	293.	283.	279.	277.	275.	272.	268.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT +	C13A-1	.48	1	FLOW	595.	583.	564.	545.	537.	532.	528.	522.	514.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	RC13A-1	.48	1	FLOW	581.	569.	551.	532.	524.	519.	515.	509.	502.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	13A-2	.19	1	FLOW	272.	267.	258.	249.	246.	243.	241.	238.	235.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	C13A-2	.66	1	FLOW	782.	766.	740.	715.	704.	697.	692.	684.	673.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	RC13A-2	.66	1	FLOW	781.	765.	738.	712.	702.	694.	689.	681.	670.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	PIC-C	.24	1	FLOW	280.	274.	265.	256.	252.	250.	248.	245.	241.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT +	CPIC-C	.91	1	FLOW	1041.	1020.	985.	951.	937.	927.	920.	909.	895.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92

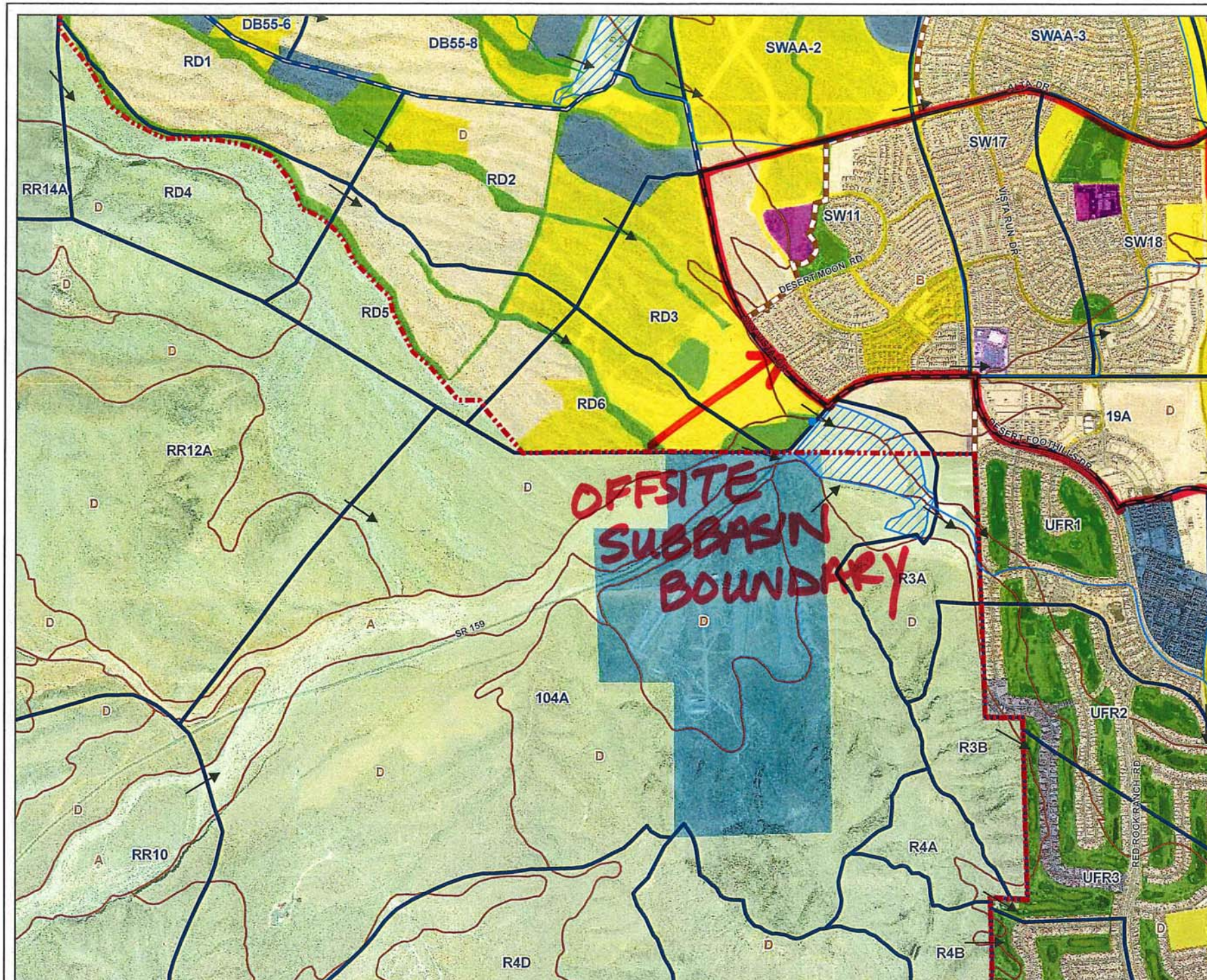
ROUTED TO +	RCPIC-C	.91	1	FLOW	1030.	1009.	975.	940.	922.	915.	908.	896.	881.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	PIC-A	.36	1	FLOW	356.	349.	338.	326.	322.	318.	316.	312.	308.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT +	CPIC-A	1.27	1	FLOW	1386.	1359.	1313.	1266.	1243.	1233.	1224.	1208.	1188.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT +	CCPIC-A	1.73	1	FLOW	1997.	1959.	1895.	1830.	1800.	1785.	1772.	1750.	1723.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO +	RCCPIC-A	1.73	1	FLOW	1974.	1921.	1874.	1792.	1776.	1769.	1758.	1721.	1690.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	57B-1	.20	1	FLOW	199.	194.	186.	179.	176.	174.	172.	170.	167.
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT +	C57B-1	1.93	1	FLOW	2106.	2049.	2004.	1912.	1900.	1876.	1862.	1824.	1791.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	4.00	4.00	4.00
2 COMBINED AT +	CC57B-1	4.60	1	FLOW	4702.	4591.	4447.	4268.	4213.	4179.	4148.	4080.	4011.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO +	RCC57B-1	4.60	1	FLOW	4694.	4583.	4439.	4260.	4205.	4170.	4139.	4071.	4002.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	57B-4	.20	1	FLOW	262.	257.	248.	239.	236.	233.	231.	229.	225.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	C57B-4	4.80	1	FLOW	4813.	4700.	4553.	4371.	4314.	4278.	4246.	4177.	4107.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	PIC-B	.44	1	FLOW	442.	433.	419.	405.	399.	395.	392.	388.	382.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO +	RPIC-B	.44	1	FLOW	439.	431.	416.	402.	396.	392.	390.	385.	379.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT +	CC57B-4	5.24	1	FLOW	5243.	5122.	4961.	4765.	4702.	4663.	4628.	4554.	4479.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO +	RCC57B-4	5.24	1	FLOW	5225.	5104.	4944.	4747.	4686.	4644.	4606.	4534.	4460.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT +	38A	.35	1	FLOW	374.	367.	355.	343.	338.	335.	333.	329.	324.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	R38A	.35	1	FLOW	368.	364.	350.	337.	333.	331.	330.	327.	320.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	38B	.44	1	FLOW	492.	483.	467.	452.	446.	442.	439.	434.	428.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT +	C38B	.79	1	FLOW	856.	842.	810.	784.	775.	769.	764.	753.	740.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT +	57BA	.32	1	FLOW	186.	180.	171.	163.	159.	157.	155.	152.	149.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO +	R57BA	.32	1	FLOW	185.	179.	171.	162.	158.	156.	154.	151.	148.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT +	3C	.15	1	FLOW	218.	214.	207.	201.	198.	196.	195.	193.	190.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	C3C	.47	1	FLOW	358.	350.	335.	322.	316.	312.	309.	305.	299.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO +	RC3C	.47	1	FLOW	358.	350.	336.	322.	316.	312.	310.	305.	300.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT +	AP	.67	1	FLOW	450.	438.	418.	398.	390.	385.	381.	375.	367.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
5 COMBINED AT +	ANGLPKIN	21.99	1	FLOW	17682.	17317.	16736.	16120.	15911.	15749.	15645.	15449.	15212.
				TIME	3.92	3.92	3.92	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO +	ANGLPKDB	21.99	1	FLOW	5746.	5406.	4785.	4149.	3879.	3713.	3566.	3372.	3116.
				TIME	5.42	5.42	5.58	5.67	5.75	5.75	5.75	5.83	5.92

** PEAK STAGES IN FEET **

1 STAGE	2620.18	2620.13	2620.04	2619.94	2619.88	2619.85	2619.82	2619.79	2619.74
TIME	5.42	5.42	5.58	5.67	5.75	5.75	5.75	5.83	5.92

Flow to Rampart + Alta Intersection →

END ref.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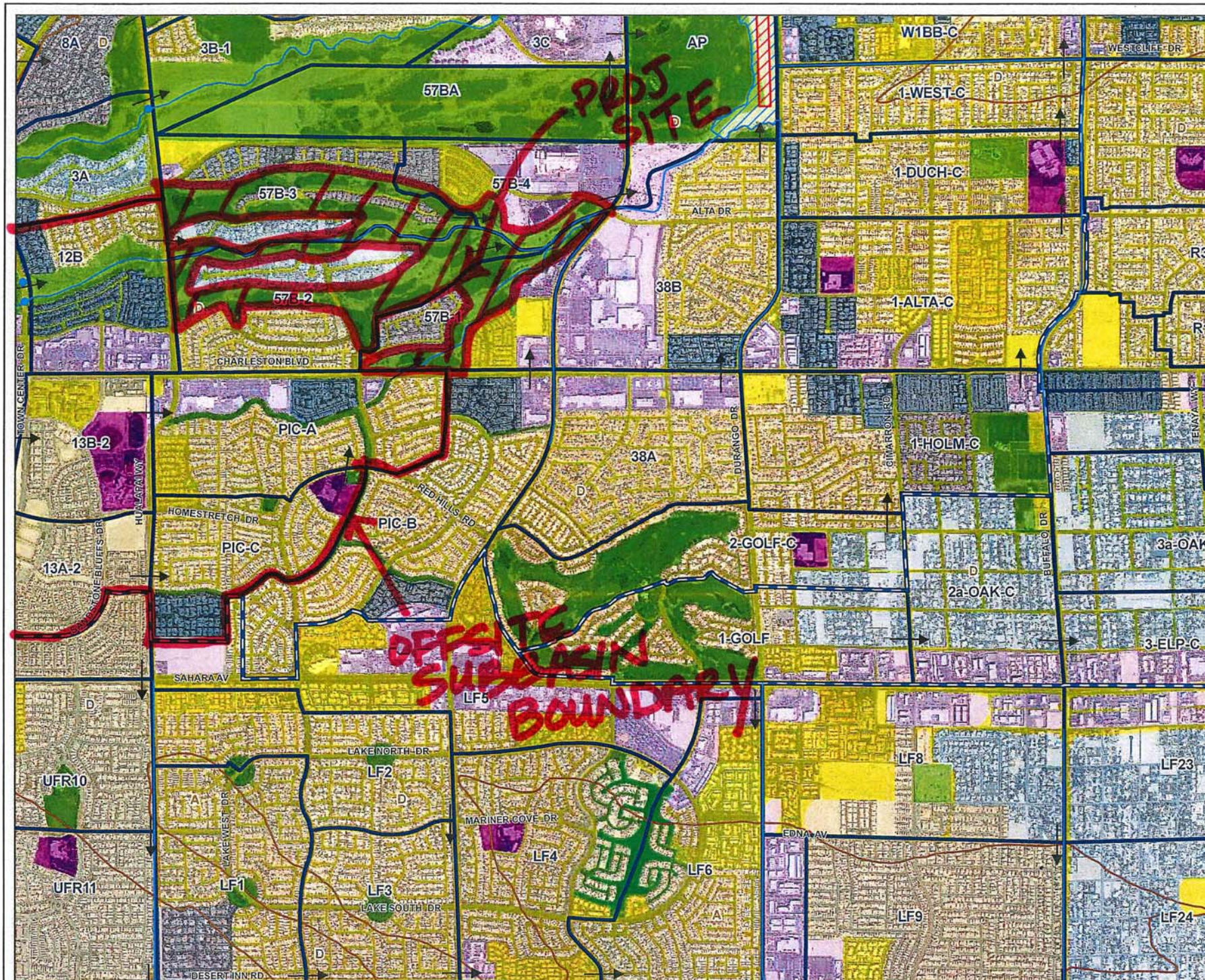
DB55-8
RD1
SWAA-2
SWAA-3
SW17
RR14A
RD4
RD2
SW11
SW18
RD5
RD3
RD6
19A
RR12A
OFFSITE SUBBASIN BOUNDARY
UFR1
R3A
SR 159
104A
UFR2
R3B
RR10
R4A
UFR3
R4B
R4D


PROJ SITE
OFFSITE SUBBASIN BOUNDARY
8A
3B-1
3C
AP
W1BB-C
WESTCLIFF DR
57BA
1-WEST-C
3A
57B-3
57B-4
1-DUCH-C
ALTA DR
12B
57B-2
57B-1
38B
1-ALTA-C
CHARLESTON BLVD
TOWN CENTER DR
13B-2
PIC-A
38A
DURANGO DR
CIMARRON RD
1-HOLM-C
HUALAPAI WY
HOMESTRETCH DR
PIC-B
RED HILLS RD
PIC-C
2-GOLF-C
13A-2
STONE BLUFFS DR
2a-OAK-C
BUFFALO DR
1-GOLF
3-ELP-C
SAHARA AV
LF5
LF8
LF23
UFR10
LAKE NORTH DR
LF2
LAKE WEST DR
MARINER COVE DR
EDNA AV
LF4
LF6
UFR11
LF1
LF3
LAKE SOUTH DR
LF9
LF24
DESERT INN RD

Federal Emergency Management Agency

Washington, D.C. 20472

OCT 19 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Oscar B. Goodman
Mayor, City of Las Vegas
City Hall, 10th Floor
400 Stewart Avenue
Las Vegas, NV 89101

IN REPLY REFER TO:
Case No.: 06-09-BF86P
Follows Conditional
Case No.: 05-09-0420R
Community Name: City of Las Vegas, NV
Community No.: 325276
Effective Date of
This Revision: OCT 19 2006

Dear Mayor Goodman:

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7175, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Division

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. Randy Fultz, P.E., CFM
Assistant City Engineer
City of Las Vegas

Mr. Kevin Eubanks, P.E., CFM
Assistant General Manager
Clark County Regional Flood Control District

Mr. Michael Ludwig, P.E., Project Manager
G.C. Wallace, Inc.

 | Issue Date: OCT 1 9 2006 | Effective Date: OCT 1 9 2006 | Case No.: 06-09-BF86P | LOMR-APP

Follows Conditional Case No.: 05-09-0420R

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Las Vegas Clark County Nevada	STORM DRAIN	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS
	COMMUNITY NO.: 325276		
IDENTIFIER	Village at Queensridge	APPROXIMATE LATITUDE & LONGITUDE: 36.168, -115.286 SOURCE: USGS QUADRANGLE DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 32003C2145 E DATE: September 27, 2002	NO REVISION TO THE FLOOD INSURANCE STUDY REPORT

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Unnamed Wash - from approximately 2,200 feet downstream to approximately 100 feet downstream of Rampart Boulevard

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Unnamed Wash	Zone A	Contained	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

109770 10.3.1.0609BF86 102-D

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance discharges computed in the submitted hydrologic model. Future development of projects upstream could cause increased discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on discharges and could, therefore, indicate that greater flood hazards exist in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

109770 10.3.1.0609BF86 102-D

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Sally M. Ziolkowski
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region IX
1111 Broadway Street, Suite 1200
Oakland, CA 94607-4052
(510) 627-7175

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

109770 10.3.1.0609BF86 102-D

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

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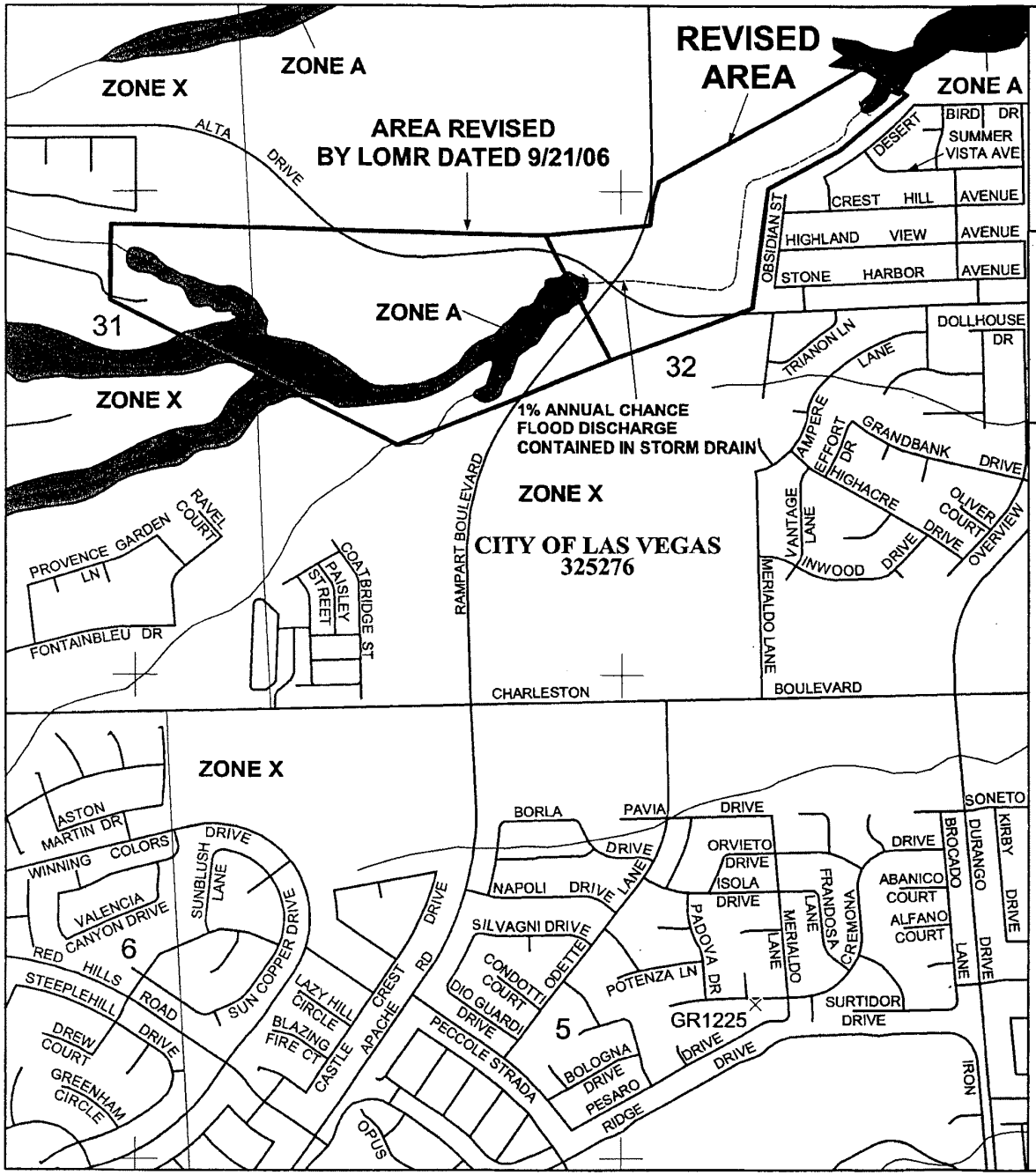
Engineering Management Section
Mitigation Division

109770 10.3.1.0609BF86 102-D



REPLY APP 0856

CLV300936

5974

Federal Emergency Management Agency

Washington, D.C. 20472

SEP 21 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Oscar Goodman
Mayor, City of Las Vegas
400 Stewart Avenue
Las Vegas, NV 89101

IN REPLY REFER TO:
Case No.: 06-09-B483P
Community Name: City of Las Vegas, NV
Community No.: 325276
Effective Date of This Revision: SEP 21 2006

Dear Mayor Goodman:

The Flood Insurance Rate Map for your community has been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Oakland, California, at (510) 627-7175, or the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Kevin C Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Division

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map

cc: Mr. Randy Fultz, P.E.
Assistant City Engineer
City of Las Vegas

Mr. Kevin Eubanks, P.E., CFM
Assistant General Manager
Clark County Regional Flood Control District

Mr. Michael J. Ludwig, P.E.
Project Manager
Flood Control District
G.C. Wallace, Inc.

 | Issue Date: SEP 2 1 2006 | Effective Date: SEP 2 1 2006 | Case No.: 06-09-B483P | LOMR-APP

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Las Vegas Clark County Nevada	CULVERT	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 325276		
IDENTIFIER	Queensridge Place	APPROXIMATE LATITUDE & LONGITUDE: 36.165, -115.293 SOURCE: USGS QUADRANGLE DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 32003C2145E DATE: September 27, 2002	NO REVISION TO THE FLOOD INSURANCE STUDY REPORT

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Unnamed Wash - from approximately 3,600 feet upstream to approximately 100 feet downstream of South Rampart Boulevard

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Unnamed Wash	Zone A	Zone A	YES	YES
	Zone A	Contained	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

106979 10.3.1.0609B483 102-I-C

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse including any related appurtenances such as bridges, culverts, and other drainage structures rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance discharges computed in the submitted hydrologic model. Future development of projects upstream could cause increased discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on discharges and could, therefore, indicate that greater flood hazards exist in this area.

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Mitigation Division

106979 10.3.1.0609B483 102-I-C

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

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Federal Emergency Management Agency, Region IX
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Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

106979 10.3.1.0609B483 102-I-C

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

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Engineering Management Section
Mitigation Division

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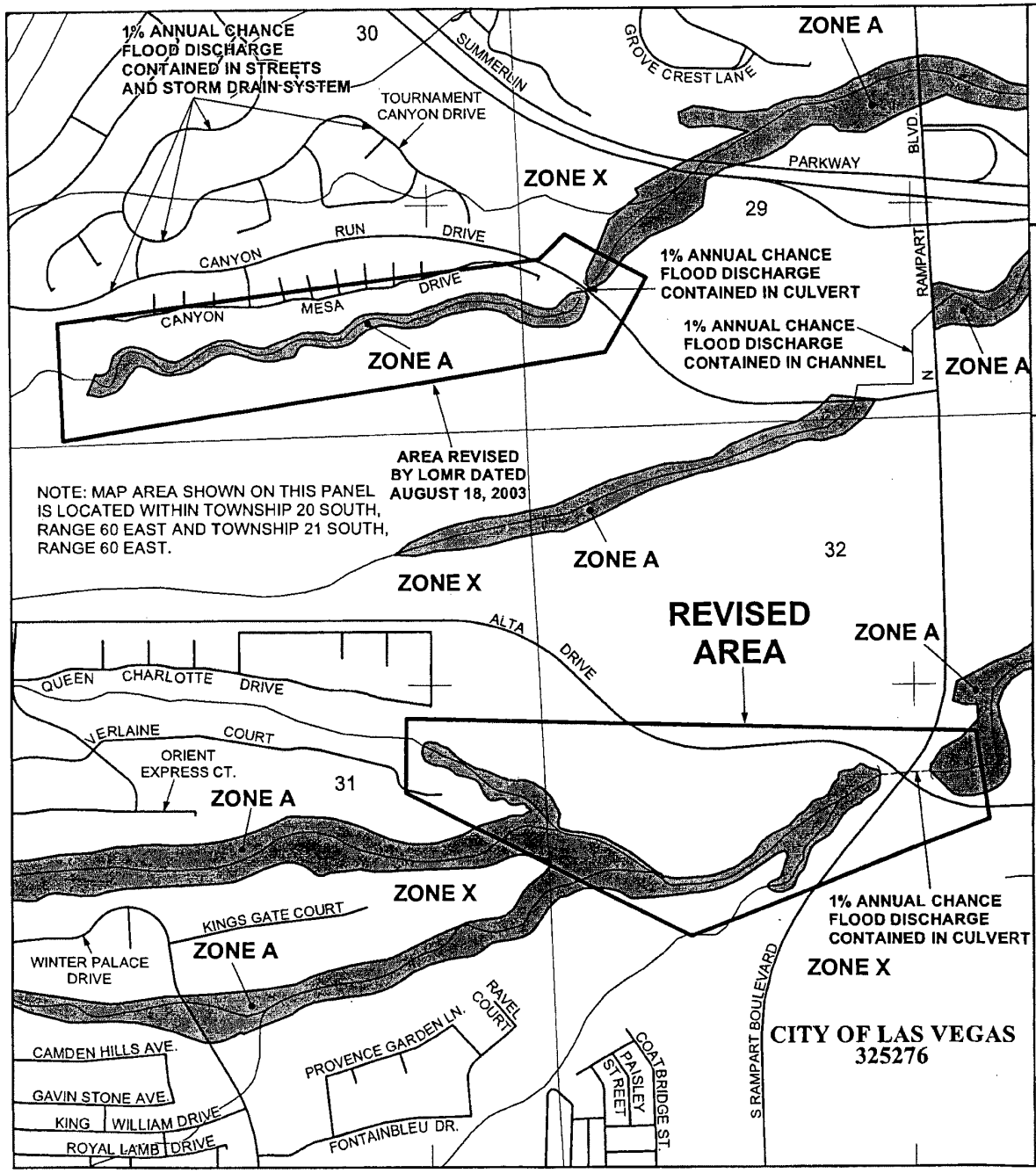


Legend

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain

MAP SCALE 1" = 1000'

500 0 1000 FEET

300 0 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2145E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,

NEVADA

AND INCORPORATED AREAS

PANEL 2145 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2145	E
LAS VEGAS, CITY OF	325276	2145	E

REVISED TO REFLECT LOMR EFFECTIVE SEP 21 2006

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 32003C2145 E

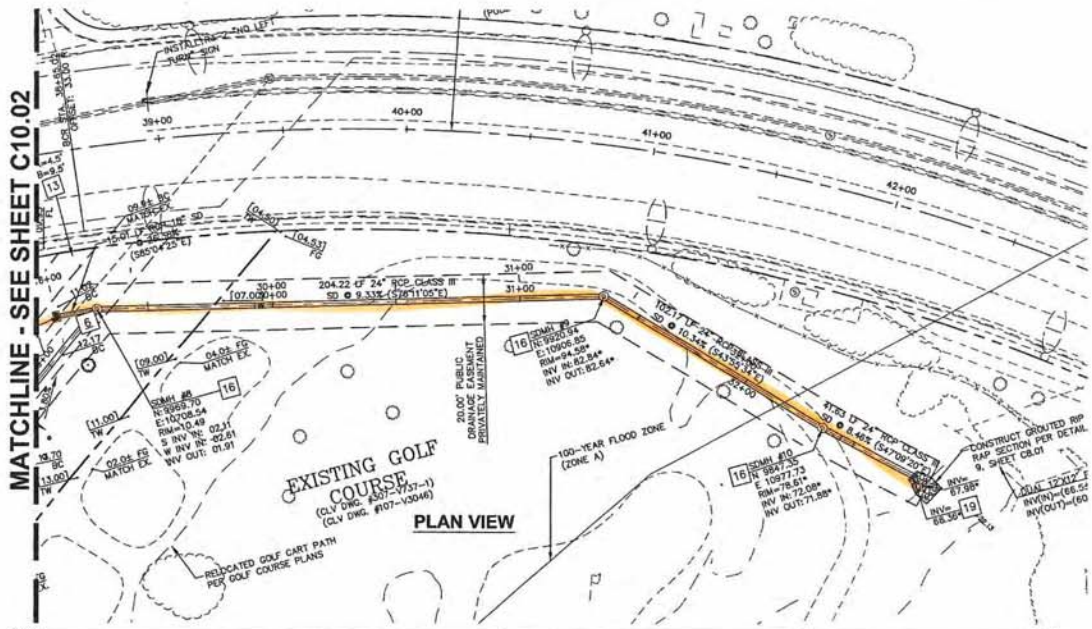
MAP REVISED SEPTEMBER 27, 2002

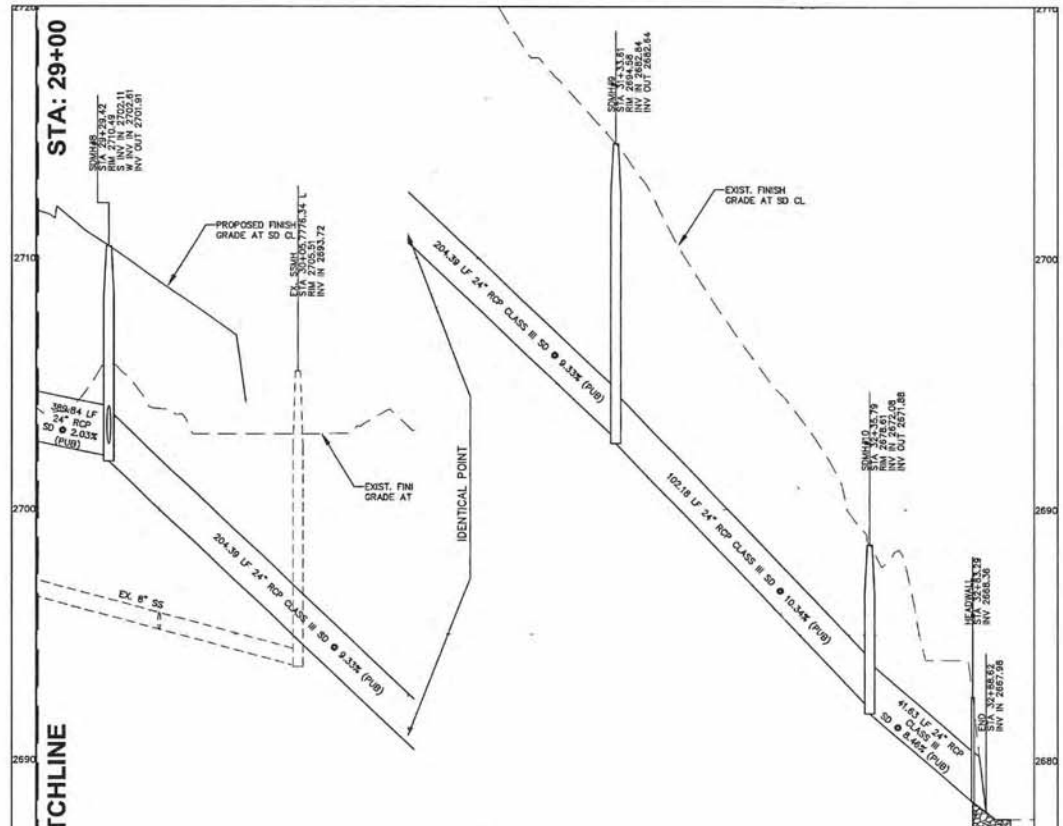
Federal Emergency Management Agency

REPLY APP 0862

CLV300942

5980





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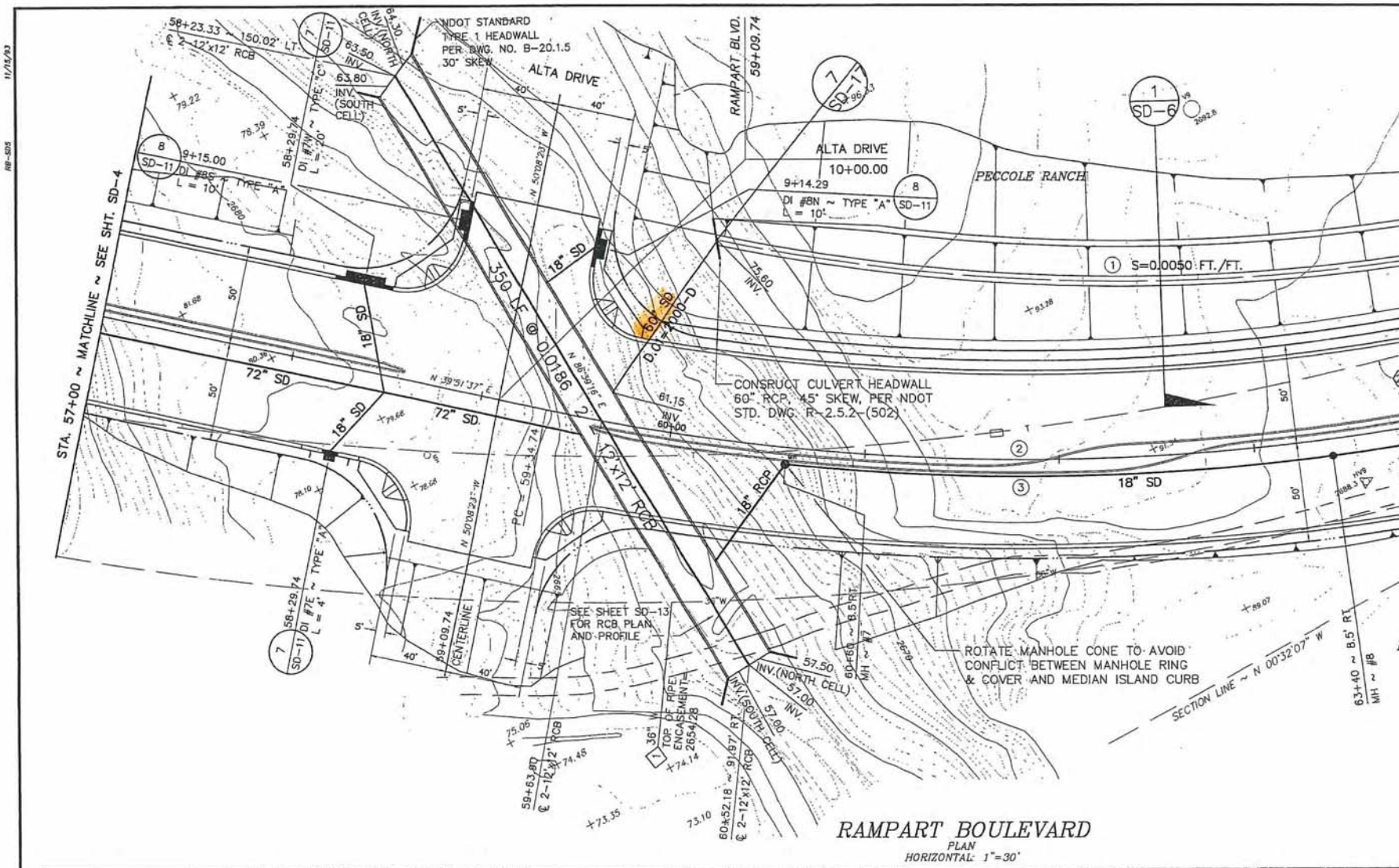
NEVADA.

REPLY APP 0863



RAMPART BOULEVARD
PLAN
HORIZONTAL: 1"=30'

REPLY APP 0864

EXHIBIT “YYYYY-2”

SUPPLEMENT TO THE TECHNICAL DRAINAGE STUDY FOR THE SEVENTY

840-050

March 2016

Prepared by:

GCW, Inc.
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299

GCW
ENGINEERS \ SURVEYORS

SUPPLEMENT TO THE TECHNICAL DRAINAGE STUDY FOR THE SEVENTY

840-050

March 2016

Prepared for:

Seventy Acres LLC, Fore Stars LTD, and 180 Land Co LLC
9775 West Charleston Boulevard
Las Vegas, NV 89117
Phone: (702) 940-6930
Fax: (702) 940-6931

Prepared by:

GCW, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299

GCW
ENGINEERS \ SURVEYORS

840-050

March 9, 2016

Peter Jackson, PE CFM
Senior Engineering Associate
City of Las Vegas - Land Development Services
Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Re: Supplement to the Technical Drainage Study for The Seventy

Dear Mr. Jackson:

The purpose of this letter is to serve as a supplement to the subject project. The hydraulic models included in The Seventy TDS submitted on March 3, 2016, include the latest CLV approved hydraulic model for CCRFCD APSO 0000. The latest approved CLV hydraulic model was referenced from the *Supplement No. 1 to the 2nd Update to the Technical Drainage Study for Queens Borough Culvert.* Note that the hydraulic models included in last week's submittal are still valid and are not revised with this supplement.

As a follow up to last week's submittal meeting, an analysis that includes the FEMA approved hydraulic model for CCRFCD Facility APSO 0000 has been included with this supplement. The FEMA approved hydraulic model for CCRFCD Facility APSO 0000 has been referenced from the *Letter of Map Revision (LOMR) for the Village at Queensridge* (hereinafter, referred to as the Queensridge LOMR). Note that the Queensridge LOMR references the *2nd Update to the Technical Drainage Study for Queens Borough Culvert* and not the latest approved supplement. The FEMA approved model has been duplicated with this supplement and extended south to include existing CCRFCD Facility APSO 0020. The revised extended model has been labeled as MAIN1LOMR_DE.WSW. An additional HEC-RAS model has been included to analyze existing CCRFCD Facility APSO 0050 and a portion of APSO 0067 with the FEMA approved flow rate of 4,497 cfs. The HEC-RAS cross section locations are labeled on Figure 9 included with last week's submittal. The HEC-RAS anlaysis is truncated at the upstream end of WSPGW model MAIN1LOMR_DE.WSW.

Additionally, the LOMR hydraulic model has been extended to include the proposed CCRFCD APSO 0050 and a portion of APSO 0067, which consists of approximately 1,560 linear feet of 14-foot wide by 12-foot high RCB and 30 linear feet transition. The model with the proposed 14-foot wide by 12-foot high RCB has been labeled as MAIN1LOMR_PE.WSW. The model shows the proposed RCB storm drain has capacity to convey the FEMA approved flow rate of 4,497 cfs. Copies of the output summaries for the MAIN1LOMR_DE.WSW and MAIN1LOMR_PE.WSW are included in the Appendix.

Digital copies of the hydraulics models are included on the attached CD.

1555 South Rainbow Boulevard
Las Vegas, Nevada 89146
O 702.804.2000
F 702.804.2298
info@gcwengineering.com
gcwengineering.com

Figure 11 has been revised to include existing topography with 1- foot contour intervals. A copy of the revised Figure 11 (labeled Figure 11R) has been included in the Appendix.

If you have any questions or require additional information, please contact our office at 804-2133.

Cordially,

GCW, INC.

Ryan R. Belsick, PE, LEED AP
Senior Vice President
Flood Control Division

jam/gt/vlr

c: Brian Schmidt, GCW
Mark Fakler, GCW


2845
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WSPGW Stations Referenced from the Village at Queensridge LOMR	MAIN 1 WSPGW Stations
-3473.91	-12119.58
-3430.31	-12075.98
-3401.01	-12046.68
-3350.81	-11996.48
-3325.95	-11971.62
-3315.95	-11961.62
-3225.64	-11871.31
-3223.32	-11868.99
-3152.70	-11798.37
-3135.29	-11780.96
-3049.99	-11695.66
-2906.52	-11552.19
-2433.63	-11079.30
-2318.22	-10963.89
-2200.00	-10845.67
-1733.86	-10379.53
-1565.00	-10210.67
-1000.00	-9645.67

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T1 THE SEVENTY
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PTS      49.170 31.000 55.900 31.000 61.570 30.000113.390 30.000127.530 31.000
PTS     135.780 31.000147.220 32.000179.850 35.000
PTS  213    .000 35.000 20.030 32.000 31.310 32.000 52.870 25.000 59.330 25.000
PTS      67.120 22.000 73.020 22.000 74.310 21.000 87.940 21.000 98.870 27.000
PTS     111.350 27.000136.370 37.000167.350 42.000
PTS  3 9    .000 35.000 16.420 33.000 39.810 22.000 52.600 21.000 77.950 20.000
PTS      89.480 24.000102.140 25.000110.760 35.960161.520 44.000
PTS  4 8    .000 48.000 19.090 48.000 50.850 45.000111.110 21.000159.240 21.000
PTS     159.240 21.000186.970 35.980248.780 40.000
PTS  5 6    .000 49.000 11.030 48.000 54.930 38.000 84.460 22.000136.390 22.000
PTS     173.210 40.000
PTS  6 6    .000 45.000 51.370 24.000 57.820 24.000 68.510 22.000103.270 22.000
PTS     153.800 44.000
PTS  725    .000 13.940  4.000 12.940  8.000 11.940 12.000 10.940 14.500  9.940
PTS      16.500  8.940 18.000  7.940 25.000   .940 37.700   .940 47.310   .123
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR_DE.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-12119.580	2630.000	4.332	2634.332	4497.00	9.55	1.41	2635.75	.00	4.33	166.56		1		0 .0
TRANS STR	-.2202					.0066	.29	4.33	1.00		.035			IR-OPEN
-12075.980	2620.400	15.512	2635.912	4497.00	3.94	.24	2636.15	.00	8.36	131.37		2		0 .0
TRANS STR	.0119					.0007	.02	15.51	.24		.040			IR-OPEN
-12046.680	2620.750	15.156	2635.906	4497.00	4.20	.27	2636.18	.00	7.11	110.00		3		0 .0
TRANS STR	.0110					.0001	.00	15.16	.24		.015			IR-OPEN
-11996.480	2621.300	14.661	2635.961	4497.00	3.83	.23	2636.19	.00	5.89	112.08		4		0 .0
TRANS STR	.0141					.0001	.00	14.66	.21		.015			IR-OPEN
-11971.620	2621.650	14.302	2635.952	4497.00	3.94	.24	2636.19	.00	5.71	107.58		5		0 .0
TRANS STR	.0160							14.302	.213		.015			IR-OPEN
-11961.620	2621.810	5.925	2627.735	4497.00	31.62	15.53	2643.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
90.311	.0152					.0249	2.24	5.93	2.34	7.02	.015	.00	.00	BOX
-11871.310	2623.180	5.731	2628.911	4497.00	32.69	16.60	2645.51	.00	10.29	25.00	12.000	25.000	.00	1 1.0
2.319	-.0776					.0263	.06	5.73	2.46	.00	.015	.00	.00	BOX
-11868.990	2623.000	5.682	2628.682	4497.00	32.98	16.89	2645.57	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
70.620	.0283					.0264	1.86	12.00	2.49	5.55	.015	.00	.00	BOX
-11798.370	2625.000	5.709	2630.709	4497.00	32.82	16.73	2647.44	.00	10.29	25.00	12.000	25.000	.00	1 1.0
17.410	.0276					.0262	.46	5.71	2.47	5.60	.015	.00	.00	BOX

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR_DE.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-11780.960	2625.480	5.714	2631.194	4497.00	32.79	16.70	2647.89	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
85.300	.0279					.0260	2.21	12.00	2.47	5.58	.015	.00	.00	BOX
-11695.660	2627.860	5.748	2633.608	4497.00	32.60	16.50	2650.11	.00	10.29	25.00	12.000	25.000	.00	1 1.0
143.470	.0279					.0253	3.63	5.75	2.45	5.58	.015	.00	.00	BOX
-11552.190	2631.860	5.829	2637.689	4497.00	32.15	16.05	2653.73	.40	10.29	25.00	12.000	25.000	.00	1 1.0
203.355	.0278					.0238	4.83	6.22	2.39	5.58	.015	.00	.00	BOX
-11348.830	2637.521	6.024	2643.545	4497.00	31.11	15.02	2658.57	.37	10.29	25.00	12.000	25.000	.00	1 1.0
165.826	.0278					.0214	3.54	6.39	2.28	5.58	.015	.00	.00	BOX
-11183.010	2642.138	6.318	2648.455	4497.00	29.66	13.66	2662.11	.34	10.29	25.00	12.000	25.000	.00	1 1.0
103.709	.0278					.0188	1.95	6.65	2.12	5.58	.015	.00	.00	BOX
-11079.300	2645.025	6.626	2651.651	4497.00	28.28	12.42	2664.07	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.185	.0278					.0168	1.01	12.00	1.98	5.58	.015	.00	.00	BOX
-11019.120	2646.700	6.888	2653.588	4497.00	27.20	11.49	2665.08	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
55.226	.0278					.0150	.83	12.00	1.86	5.58	.015	.00	.00	BOX
-10963.890	2648.238	7.224	2655.462	4497.00	25.94	10.45	2665.91	.00	10.29	25.00	12.000	25.000	.00	1 1.0
26.695	.0278					.0136	.36	7.22	1.74	5.58	.015	.00	.00	BOX
-10937.200	2648.981	7.440	2656.421	4497.00	25.19	9.85	2666.27	.00	10.29	25.00	12.000	25.000	.00	1 1.0
34.208	.0278					.0123	.42	7.44	1.66	5.58	.015	.00	.00	BOX

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR_DE.WSW JAM

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-10902.990	2649.934	7.803	2657.737	4497.00	24.01	8.95	2666.69	.00	10.29	25.00	12.000	25.000	.00	1 1.0
25.508	.0278					.0109	.28	7.80	1.55	5.58	.015	.00	.00	BOX
-10877.480	2650.644	8.184	2658.828	4497.00	22.90	8.14	2666.97	.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.681	.0278					.0096	.18	8.18	1.44	5.58	.015	.00	.00	BOX
-10858.800	2651.165	8.583	2659.748	4497.00	21.83	7.40	2667.15	.00	10.29	25.00	12.000	25.000	.00	1 1.0
13.129	.0278					.0085	.11	8.58	1.34	5.58	.015	.00	.00	BOX
-10845.670	2651.530	9.002	2660.532	4497.00	20.81	6.73	2667.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.479	.0080					.0080	.48	9.00	1.25	9.00	.015	.00	.00	BOX
-10785.190	2652.014	9.002	2661.016	4497.00	20.81	6.73	2667.74	.00	10.29	25.00	12.000	25.000	.00	1 1.0
405.661	.0080					.0077	3.14	9.00	1.25	9.00	.015	.00	.00	BOX
-10379.530	2655.259	9.255	2664.514	4497.00	20.25	6.36	2670.88	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
54.738	.0080					.0074	.40	12.00	1.20	9.00	.015	.00	.00	BOX
-10324.790	2655.697	9.355	2665.052	4497.00	20.03	6.23	2671.28	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
95.389	.0080					.0069	.65	12.00	1.18	9.00	.015	.00	.00	BOX
-10229.400	2656.460	9.811	2666.271	4497.00	19.10	5.66	2671.94	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.732	.0080					.0061	.11	12.00	1.10	9.00	.015	.00	.00	BOX
-10210.670	2656.610	10.291	2666.901	4497.00	18.21	5.15	2672.05	.00	10.29	25.00	12.000	25.000	.00	1 1.0
88.311	.0050					.0051	.45	10.29	1.02	10.85	.015	.00	.00	BOX

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:31:37

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR_DE.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-10122.360	2657.052	10.793	2667.846	4497.00	17.36	4.68	2672.53	.00	10.29	25.00	12.000	25.000	.00	1 1.0
82.345	.0050					.0051	.42	10.79	.95	10.85	.015	.00	.00	BOX
-10040.010	2657.465	10.812	2668.277	4497.00	17.33	4.66	2672.94	.00	10.29	25.00	12.000	25.000	.00	1 1.0
HYDRAULIC JUMP														
---------- WARNING - Flow depth near top of box conduit ----------														
-10040.010	2657.465	9.788	2667.253	4497.00	19.14	5.69	2672.94	.00	10.29	25.00	12.000	25.000	.00	1 1.0
35.034	.0050					.0067	.23	9.79	1.10	10.85	.015	.00	.00	BOX
-10004.980	2657.640	9.532	2667.172	4497.00	19.66	6.00	2673.17	.00	10.29	25.00	12.000	25.000	.00	1 1.0
66.334	.0050					.0074	.49	9.53	1.15	10.85	.015	.00	.00	BOX
-9938.646	2657.972	9.088	2667.061	4497.00	20.62	6.60	2673.66	.00	10.29	25.00	12.000	25.000	.00	1 1.0
71.788	.0050					.0083	.60	9.09	1.23	10.85	.015	.00	.00	BOX
-9866.858	2658.332	8.665	2666.998	4497.00	21.62	7.26	2674.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
73.782	.0050					.0094	.69	8.67	1.32	10.85	.015	.00	.00	BOX
-9793.076	2658.702	8.262	2666.964	4497.00	22.68	7.99	2674.95	.00	10.29	25.00	12.000	25.000	.00	1 1.0
74.048	.0050					.0106	.79	8.26	1.42	10.85	.015	.00	.00	BOX
-9719.028	2659.073	7.878	2666.950	4497.00	23.79	8.78	2675.74	.00	10.29	25.00	12.000	25.000	.00	1 1.0
73.358	.0050					.0120	.88	7.88	1.52	10.85	.015	.00	.00	BOX

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WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:31:37

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR_DE.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-9645.670	2659.440	7.511	2666.951	4497.00	24.95	9.66	2676.61	.00	10.29	25.00	12.000	25.000	.00	1 1.0
27.749	.0051					.0130	.36	7.51	1.64	10.77	.015	.00	.00	BOX
-9617.921	2659.582	7.377	2666.958	4497.00	25.40	10.02	2676.98	.00	10.29	25.00	12.000	25.000	.00	1 1.0
72.251	.0051					.0142	1.03	7.38	1.68	10.77	.015	.00	.00	BOX
-9545.669	2659.950	7.034	2666.983	4497.00	26.64	11.02	2678.00	.00	10.29	25.00	12.000	25.000	.00	1 1.0

124.827	.0194					.0142	1.78	7.03	1.81	6.39	.015	.00	.00	BOX		
-9420.842	2662.375	7.371	2669.746	4497.00	25.42	10.03	2679.78	.00	10.29	25.00	12.000	25.000	.00	1	1.0	
80.695	.0194					.0126	1.02	7.37	1.68	6.39	.015	.00	.00	BOX		
-9340.146	2663.943	7.731	2671.674	4497.00	24.24	9.12	2680.80	.00	10.29	25.00	12.000	25.000	.00	1	1.0	
54.427	.0194					.0111	.61	7.73	1.57	6.39	.015	.00	.00	BOX		
-9285.720	2665.000	8.108	2673.109	4497.00	23.11	8.29	2681.40	.00	10.29	25.00	12.000	25.000	.00	1	1.0	
37.362	.0194					.0098	.37	8.11	1.46	6.39	.015	.00	.00	BOX		
-9248.357	2665.726	8.504	2674.230	4497.00	22.03	7.54	2681.77	.00	10.29	25.00	12.000	25.000	.00	1	1.0	
25.229	.0194					.0087	.22	8.50	1.36	6.39	.015	.00	.00	BOX		
-9223.129	2666.216	8.919	2675.135	4497.00	21.01	6.85	2681.99	.00	10.29	25.00	12.000	25.000	.00	1	1.0	
16.034	.0194					.0077	.12	8.92	1.27	6.39	.015	.00	.00	BOX		
-9207.095	2666.528	9.355	2675.882	4497.00	20.03	6.23	2682.11	.00	10.29	25.00	12.000	25.000	.00	1	1.0	
8.728	.0194					.0069	.06	9.35	1.18	6.39	.015	.00	.00	BOX		

Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:31:37

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR_DE.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-9198.367	2666.698	9.811	2676.509	4497.00	19.10	5.66	2682.17	.00	10.29	25.00	12.000	25.000	.00	1 1.0
2.697	.0194					.0061	.02	9.81	1.10	6.39	.015	.00	.00	BOX
-9195.670	2666.750	10.291	2677.041	4497.00	18.21	5.15	2682.19	.00	10.29	25.00	12.000	25.000	.00	1 1.0

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T1 THE SEVENTY
T2   GCW INC. PROJECT# 840.050
T3   FILENAME: MAIN1LOMR.WSW   JAM
SO -12119.5802630.000  1                          2634.310
TS -12075.9802620.400  2      .035                                  .000
TS -12046.6802620.750  3      .040                                  .000
TS -11996.4802621.300  4      .015                                  .000
TS -11971.6202621.650  5      .015                                  .000
TS -11961.6202621.810 10      .015                                  .000
R  -11871.3102623.180 10      .015                                  .000
R  -11868.9902623.000 10      .015                                  .000    .000 0
R  -11798.3702625.000 10      .015                                -40.463
R  -11780.9602625.480 10      .015                                  .000
R  -11695.6602627.860 10      .015                                 48.868
R  -11552.1902631.860 10      .015                                  .000
R  -11079.3002645.025 10      .015                                 13.909
R  -10963.8902648.238 10      .015                                -66.125
R  -10845.6702651.530 10      .015                                  .000
R  -10379.5302655.259 10      .015                                  .000    .000 0
R  -10210.6702656.610 10      .015                                 90.000
R   -9645.6702659.440 10      .015                                  .000    .000 0
R   -9545.6702659.950 10      .015                                  .000  11.000 0
R   -9195.6702666.750 10      .015                                  .000
WE  -9195.6702666.750 12
TS  -9165.7302668.537 13      .015                                  .000
R   -9119.1702671.317 13      .015                                  .000
R   -9030.8402672.200 13      .015                                 34.000
R   -8709.6402675.412 13      .015                                  .000
R   -8668.3802675.825 13      .015                                  .000
R   -8634.8002676.161 13      .015                                 12.000
R   -8544.4602677.064 13      .015                                  .000
R   -8492.2502677.586 13      .015                                -19.000
R   -7909.6402683.412 13      .015                                  .000
R   -7776.9102684.766 13      .015                                  .000
R   -7745.0202686.243 13      .015                                  .000
R   -7605.9502692.682 13      .015                                -15.300
SH  -7605.9502692.682 13                          .000
CD  10  3   1   1.000  12.000   25.000  .000  .000  .00
CD  11  3   0    .000   9.000   17.000  .000  .000  .00
CD  12  3   0    .000  12.000   25.000  .000  .000  .00
CD  13  3   0    .000  12.000   14.000  .000  .000  .00
CD  14  3   0    .000   9.000   14.000  .000  .000  .00
CD  15  3   0    .000   8.000   10.000  .000  .000  .00
CD  16  4   0    .000   6.000     .000  .000  .000  .00
CD  17  4   0    .000   4.000     .000  .000  .000  .00
CD  18  3   1   1.000   9.000   25.000  .000  .000  .00
CD  19  3   0    .000   9.000   15.000  .000  .000  .00
CD  20  3   0    .000   9.000   20.000  .000  .000  .00
CD   1  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
CD   2  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
CD   3  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
CD   4  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
CD   5  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
CD   6  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
CD   7  5   0    .000             .00    .00   .00   .00   .00   .00   .00   .00   .00   .00
PTS  113   .000 35.000  9.010 34.000 18.610 34.000 20.870 33.000 33.510 33.000
PTS      49.170 31.000 55.900 31.000 61.570 30.000113.390 30.000127.530 31.000
PTS     135.780 31.000147.220 32.000179.850 35.000
PTS  213   .000 35.000 20.030 32.000 31.310 32.000 52.870 25.000 59.330 25.000
PTS      67.120 22.000 73.020 22.000 74.310 21.000 87.940 21.000 98.870 27.000
PTS     111.350 27.000136.370 37.000167.350 42.000
PTS  3 9   .000 35.000 16.420 33.000 39.810 22.000 52.600 21.000 77.950 20.000
PTS      89.480 24.000102.140 25.000110.760 35.960161.520 44.000
PTS  4 8   .000 48.000 19.090 48.000 50.850 45.000111.110 21.000159.240 21.000
PTS     159.240 21.000186.970 35.980248.780 40.000
PTS  5 6   .000 49.000 11.030 48.000 54.930 38.000 84.460 22.000136.390 22.000
PTS     173.210 40.000
PTS  6 6   .000 45.000 51.370 24.000 57.820 24.000 68.510 22.000103.270 22.000
PTS     153.800 44.000
PTS  725   .000 13.940  4.000 12.940  8.000 11.940 12.000 10.940 14.500  9.940
PTS      16.500  8.940 18.000  7.940 25.000   .940 37.700   .940 47.310   .123
PTS      59.610   .000 72.160   .123 81.520  3.280 91.110  3.940 98.360  4.940
PTS     107.510  5.440119.510  5.940121.510  6.940123.510  7.940125.510  8.940
PTS     127.510  9.940129.510 10.940131.510 11.940133.510 12.940135.510 13.940
Q         4497.000   .0
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THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-12119.580	2630.000	4.332	2634.332	4497.00	9.55	1.41	2635.75	.00	4.33	166.56		1		0 .0
TRANS STR	-.2202					.0066	.29	4.33	1.00		.035			IR-OPEN
-12075.980	2620.400	15.512	2635.912	4497.00	3.94	.24	2636.15	.00	8.36	131.37		2		0 .0
TRANS STR	.0119					.0007	.02	15.51	.24		.040			IR-OPEN
-12046.680	2620.750	15.156	2635.906	4497.00	4.20	.27	2636.18	.00	7.11	110.00		3		0 .0
TRANS STR	.0110					.0001	.00	15.16	.24		.015			IR-OPEN
-11996.480	2621.300	14.661	2635.961	4497.00	3.83	.23	2636.19	.00	5.89	112.08		4		0 .0
TRANS STR	.0141					.0001	.00	14.66	.21		.015			IR-OPEN
-11971.620	2621.650	14.302	2635.952	4497.00	3.94	.24	2636.19	.00	5.71	107.58		5		0 .0
TRANS STR	.0160							14.302	.213		.015			IR-OPEN
-11961.620	2621.810	5.925	2627.735	4497.00	31.62	15.53	2643.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
90.311	.0152					.0249	2.24	5.93	2.34	7.02	.015	.00	.00	BOX
-11871.310	2623.180	5.731	2628.911	4497.00	32.69	16.60	2645.51	.00	10.29	25.00	12.000	25.000	.00	1 1.0
2.319	-.0776					.0263	.06	5.73	2.46	.00	.015	.00	.00	BOX
-11868.990	2623.000	5.682	2628.682	4497.00	32.98	16.89	2645.57	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
70.620	.0283					.0264	1.86	12.00	2.49	5.55	.015	.00	.00	BOX
-11798.370	2625.000	5.709	2630.709	4497.00	32.82	16.73	2647.44	.00	10.29	25.00	12.000	25.000	.00	1 1.0
17.410	.0276					.0262	.46	5.71	2.47	5.60	.015	.00	.00	BOX

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-11780.960	2625.480	5.714	2631.194	4497.00	32.79	16.70	2647.89	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
85.300	.0279					.0260	2.21	12.00	2.47	5.58	.015	.00	.00	BOX
-11695.660	2627.860	5.748	2633.608	4497.00	32.60	16.50	2650.11	.00	10.29	25.00	12.000	25.000	.00	1 1.0
143.470	.0279					.0253	3.63	5.75	2.45	5.58	.015	.00	.00	BOX
-11552.190	2631.860	5.829	2637.689	4497.00	32.15	16.05	2653.73	.40	10.29	25.00	12.000	25.000	.00	1 1.0
203.355	.0278					.0238	4.83	6.22	2.39	5.58	.015	.00	.00	BOX
-11348.830	2637.521	6.024	2643.545	4497.00	31.11	15.02	2658.57	.37	10.29	25.00	12.000	25.000	.00	1 1.0
165.826	.0278					.0214	3.54	6.39	2.28	5.58	.015	.00	.00	BOX
-11183.010	2642.138	6.318	2648.455	4497.00	29.66	13.66	2662.11	.34	10.29	25.00	12.000	25.000	.00	1 1.0
103.709	.0278					.0188	1.95	6.65	2.12	5.58	.015	.00	.00	BOX
-11079.300	2645.025	6.626	2651.651	4497.00	28.28	12.42	2664.07	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.185	.0278					.0168	1.01	12.00	1.98	5.58	.015	.00	.00	BOX
-11019.120	2646.700	6.888	2653.588	4497.00	27.20	11.49	2665.08	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
55.226	.0278					.0150	.83	12.00	1.86	5.58	.015	.00	.00	BOX
-10963.890	2648.238	7.224	2655.462	4497.00	25.94	10.45	2665.91	.00	10.29	25.00	12.000	25.000	.00	1 1.0
26.695	.0278					.0136	.36	7.22	1.74	5.58	.015	.00	.00	BOX
-10937.200	2648.981	7.440	2656.421	4497.00	25.19	9.85	2666.27	.00	10.29	25.00	12.000	25.000	.00	1 1.0
34.208	.0278					.0123	.42	7.44	1.66	5.58	.015	.00	.00	BOX

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-10902.990	2649.934	7.803	2657.737	4497.00	24.01	8.95	2666.69	.00	10.29	25.00	12.000	25.000	.00	1 1.0
25.508	.0278					.0109	.28	7.80	1.55	5.58	.015	.00	.00	BOX
-10877.480	2650.644	8.184	2658.828	4497.00	22.90	8.14	2666.97	.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.681	.0278					.0096	.18	8.18	1.44	5.58	.015	.00	.00	BOX
-10858.800	2651.165	8.583	2659.748	4497.00	21.83	7.40	2667.15	.00	10.29	25.00	12.000	25.000	.00	1 1.0
13.129	.0278					.0085	.11	8.58	1.34	5.58	.015	.00	.00	BOX
-10845.670	2651.530	9.002	2660.532	4497.00	20.81	6.73	2667.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
40.040	.0080					.0080	.32	9.00	1.25	9.00	.015	.00	.00	BOX
-10805.630	2651.850	9.002	2660.853	4497.00	20.81	6.73	2667.58	.00	10.29	25.00	12.000	25.000	.00	1 1.0
426.100	.0080					.0079	3.36	9.00	1.25	9.00	.015	.00	.00	BOX
-10379.530	2655.259	9.107	2664.366	4497.00	20.57	6.57	2670.94	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
168.860	.0080					.0076	1.28	12.00	1.23	9.00	.015	.00	.00	BOX
-10210.670	2656.611	9.279	2665.890	4497.00	20.19	6.33	2672.22	.00	10.29	25.00	12.000	25.000	.00	1 1.0
62.361	.0050					.0078	.49	9.28	1.19	10.85	.015	.00	.00	BOX
-10148.310	2656.923	8.892	2665.815	4497.00	21.07	6.89	2672.71	.00	10.29	25.00	12.000	25.000	.00	1 1.0
72.990	.0050					.0088	.64	8.89	1.27	10.85	.015	.00	.00	BOX
-10075.320	2657.288	8.479	2665.767	4497.00	22.10	7.58	2673.35	.00	10.29	25.00	12.000	25.000	.00	1 1.0
74.059	.0050					.0099	.73	8.48	1.37	10.85	.015	.00	.00	BOX

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:35:46

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-10001.260	2657.659	8.084	2665.743	4497.00	23.18	8.34	2674.09	.00	10.29	25.00	12.000	25.000	.00	1 1.0
73.822	.0050					.0112	.83	8.08	1.47	10.85	.015	.00	.00	BOX
-9927.438	2658.029	7.708	2665.737	4497.00	24.31	9.18	2674.91	.00	10.29	25.00	12.000	25.000	.00	1 1.0
72.839	.0050					.0127	.92	7.71	1.57	10.85	.015	.00	.00	BOX
-9854.599	2658.394	7.349	2665.743	4497.00	25.50	10.09	2675.84	.00	10.29	25.00	12.000	25.000	.00	1 1.0
71.407	.0050					.0144	1.03	7.35	1.69	10.85	.015	.00	.00	BOX
-9783.191	2658.751	7.007	2665.758	4497.00	26.74	11.10	2676.86	.00	10.29	25.00	12.000	25.000	.00	1 1.0
69.699	.0050					.0163	1.13	7.01	1.82	10.85	.015	.00	.00	BOX
-9713.492	2659.100	6.681	2665.781	4497.00	28.05	12.21	2678.00	.00	10.29	25.00	12.000	25.000	.00	1 1.0
67.822	.0050					.0184	1.25	6.68	1.95	10.85	.015	.00	.00	BOX
-9645.670	2659.440	6.370	2665.810	4497.00	29.41	13.44	2679.25	.00	10.29	25.00	12.000	25.000	.00	1 1.0
34.872	.0051					.0203	.71	6.37	2.10	10.77	.015	.00	.00	BOX
-9610.798	2659.618	6.214	2665.831	4497.00	30.16	14.12	2679.95	.00	10.29	25.00	12.000	25.000	.00	1 1.0
65.128	.0051					.0223	1.46	6.21	2.18	10.77	.015	.00	.00	BOX
-9545.670	2659.950	5.924	2665.874	4497.00	31.63	15.53	2681.41	.00	10.29	25.00	12.000	25.000	.00	1 1.0
190.263	.0194					.0251	4.78	5.92	2.34	6.39	.015	.00	.00	BOX
-9355.407	2663.646	5.687	2669.333	4497.00	32.95	16.86	2686.19	.00	10.29	25.00	12.000	25.000	.00	1 1.0
159.737	.0194					.0283	4.52	5.69	2.49	6.39	.015	.00	.00	BOX

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:35:46

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-9195.670	2666.750	5.422	2672.172	4497.00	34.56	18.54	2690.72	.00	10.29	25.00	12.000	25.000	.00	1 1.0
WALL ENTRANCE														
-9195.670	2666.750	4.935	2671.685	4497.00	36.45	20.63	2692.31	.00	10.02	25.00	12.000	25.000	.00	0 .0
TRANS STR	.0597					.0201	.60	4.94	2.89		.015	.00	.00	BOX

-9165.729	2668.537	10.223	2678.760	4497.00	31.42	15.33	2694.09	.00	12.00	14.00	12.000	14.000	.00	0	.0	
17.556	.0597					.0143	.25	10.22	1.73	6.05	.015	.00	.00	BOX		
-9148.174	2669.585	10.662	2680.247	4497.00	30.13	14.09	2694.34	.00	12.00	14.00	12.000	14.000	.00	0	.0	
16.210	.0597					.0128	.21	10.66	1.63	6.05	.015	.00	.00	BOX		
-9131.964	2670.553	11.183	2681.736	4497.00	28.72	12.81	2694.55	.00	12.00	14.00	12.000	14.000	.00	0	.0	
12.794	.0597					.0113	.14	11.18	1.51	6.05	.015	.00	.00	BOX		

---------- WARNING - Flow depth near top of box conduit ----------

-9119.170	2671.317	11.728	2683.045	4497.00	27.39	11.65	2694.69	12.00	12.00	14.00	12.000	14.000	.00	0	.0	
88.330	.0100					.0107	.95	12.00	1.41	12.00	.015	.00	.00	BOX		

---------- WARNING - Flow depth near top of box conduit ----------

-9030.840	2672.200	11.664	2683.864	4497.00	27.54	11.78	2695.64	.00	12.00	14.00	12.000	14.000	.00	0	.0	
321.200	.0100					.0112	3.61	11.66	1.42	12.00	.015	.00	.00	BOX		

---------- WARNING - Flow depth near top of box conduit ----------

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:35:46

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-8709.640	2675.412	11.307	2686.719	4497.00	28.41	12.53	2699.25	.00	12.00	14.00	12.000	14.000	.00	0 .0
41.260	.0100					.0118	.48	11.31	1.49	12.00	.015	.00	.00	BOX

---------- WARNING - Flow depth near top of box conduit ----------

-8668.380	2675.825	11.248	2687.073	4497.00	28.56	12.66	2699.74	12.00	12.00	14.00	12.000	14.000	.00	0	.0	
33.580	.0100					.0119	.40	12.00	1.50	12.00	.015	.00	.00	BOX		

---------- WARNING - Flow depth near top of box conduit ----------

-8634.800	2676.161	11.198	2687.359	4497.00	28.69	12.78	2700.14	.00	12.00	14.00	12.000	14.000	.00	0	.0	
90.340	.0100					.0122	1.10	11.20	1.51	12.00	.015	.00	.00	BOX		

---------- WARNING - Flow depth near top of box conduit ----------

-8544.460	2677.064	11.050	2688.114	4497.00	29.07	13.12	2701.24	12.00	12.00	14.00	12.000	14.000	.00	0	.0	
52.210	.0100					.0125	.65	12.00	1.54	12.00	.015	.00	.00	BOX		

---------- WARNING - Flow depth near top of box conduit ----------

Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:35:46

THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-8492.251	2677.586	10.956	2688.542	4497.00	29.32	13.35	2701.89	.00	12.00	14.00	12.000	14.000	.00	0 .0
228.189	.0100					.0134	3.06	10.96	1.56	12.00	.015	.00	.00	BOX

---------- WARNING - Flow depth near top of box conduit ----------

-8264.062	2679.868	10.474	2690.342	4497.00	30.67	14.61	2704.95	.00	12.00	14.00	12.000	14.000	.00	0	.0	
191.796	.0100					.0151	2.89	10.47	1.67	12.00	.015	.00	.00	BOX		
-8072.265	2681.786	9.986	2691.772	4497.00	32.17	16.07	2707.84	.00	12.00	14.00	12.000	14.000	.00	0	.0	
162.625	.0100					.0170	2.77	9.99	1.79	12.00	.015	.00	.00	BOX		
-7909.640	2683.412	9.521	2692.934	4497.00	33.74	17.67	2710.61	.00	12.00	14.00	12.000	14.000	.00	0	.0	
132.730	.0102					.0191	2.54	9.52	1.93	12.00	.015	.00	.00	BOX		
-7776.910	2684.766	9.122	2693.888	4497.00	35.21	19.26	2713.14	.00	12.00	14.00	12.000	14.000	.00	0	.0	
31.890	.0463					.0194	.62	9.12	2.05	6.65	.015	.00	.00	BOX		
-7745.020	2686.243	9.405	2695.647	4497.00	34.16	18.11	2713.76	.97	12.00	14.00	12.000	14.000	.00	0	.0	
5.129	.0463					.0185	.09	10.38	1.96	6.65	.015	.00	.00	BOX		
-7739.891	2686.480	9.455	2695.936	4497.00	33.97	17.92	2713.86	.96	12.00	14.00	12.000	14.000	.00	0	.0	
40.308	.0463					.0173	.70	10.42	1.95	6.65	.015	.00	.00	BOX		
-7699.583	2688.347	9.917	2698.263	4497.00	32.39	16.29	2714.56	.88	12.00	14.00	12.000	14.000	.00	0	.0	
32.211	.0463					.0153	.49	10.79	1.81	6.65	.015	.00	.00	BOX		

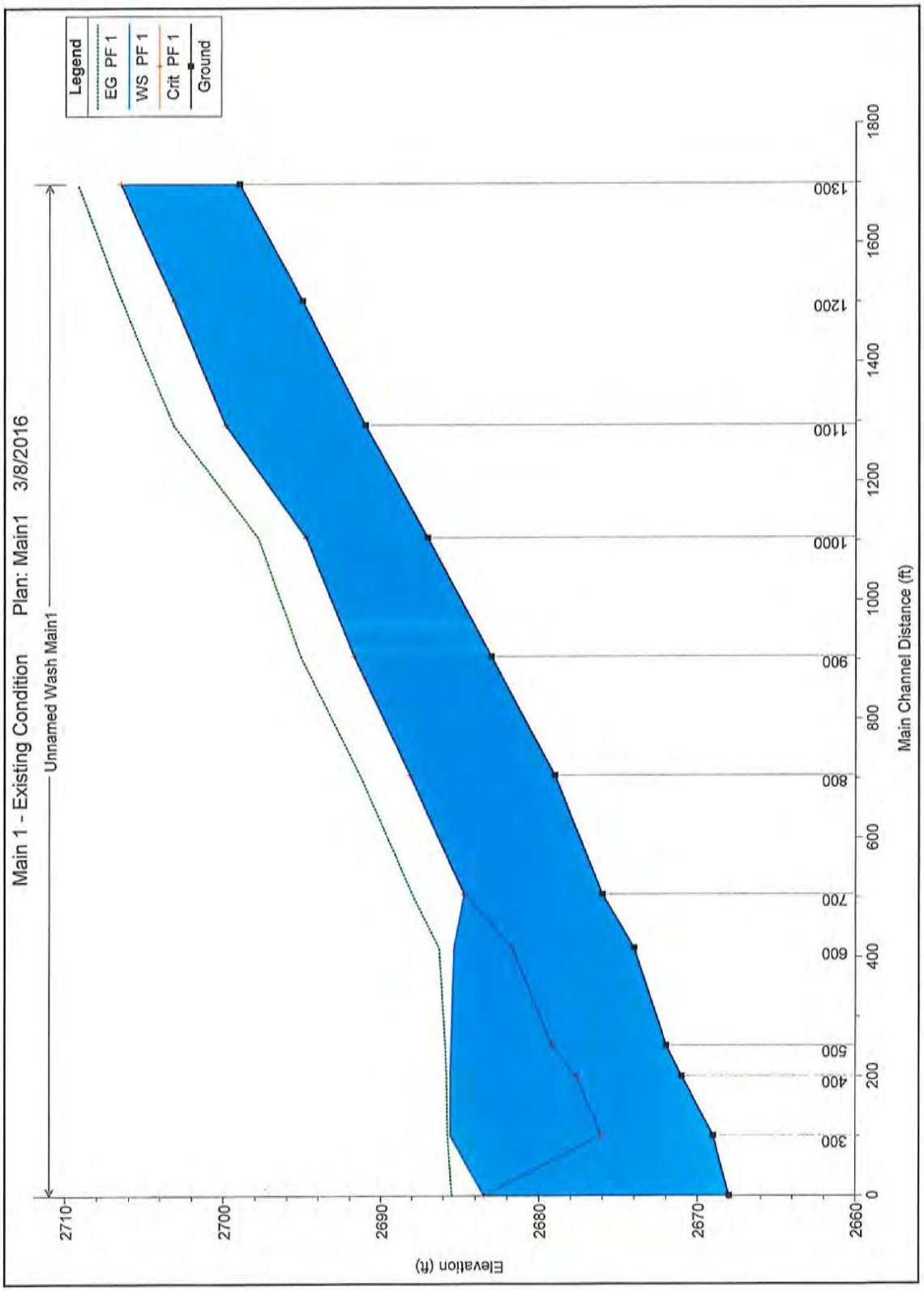
Program Package Serial Number: 7044
WATER SURFACE PROFILE LISTING Date: 3- 8-2016 Time:11:35:46

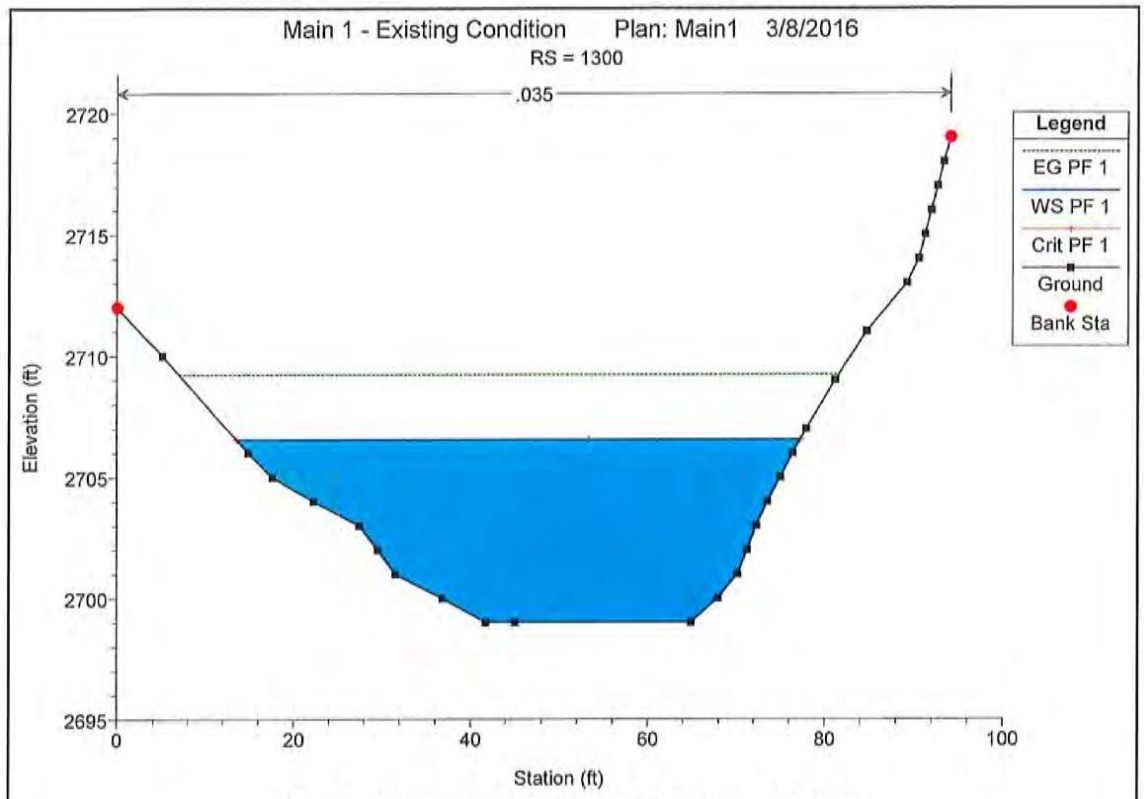
THE SEVENTY
GCW INC. PROJECT# 840.050
FILENAME: MAIN1LOMR.WSW JAM

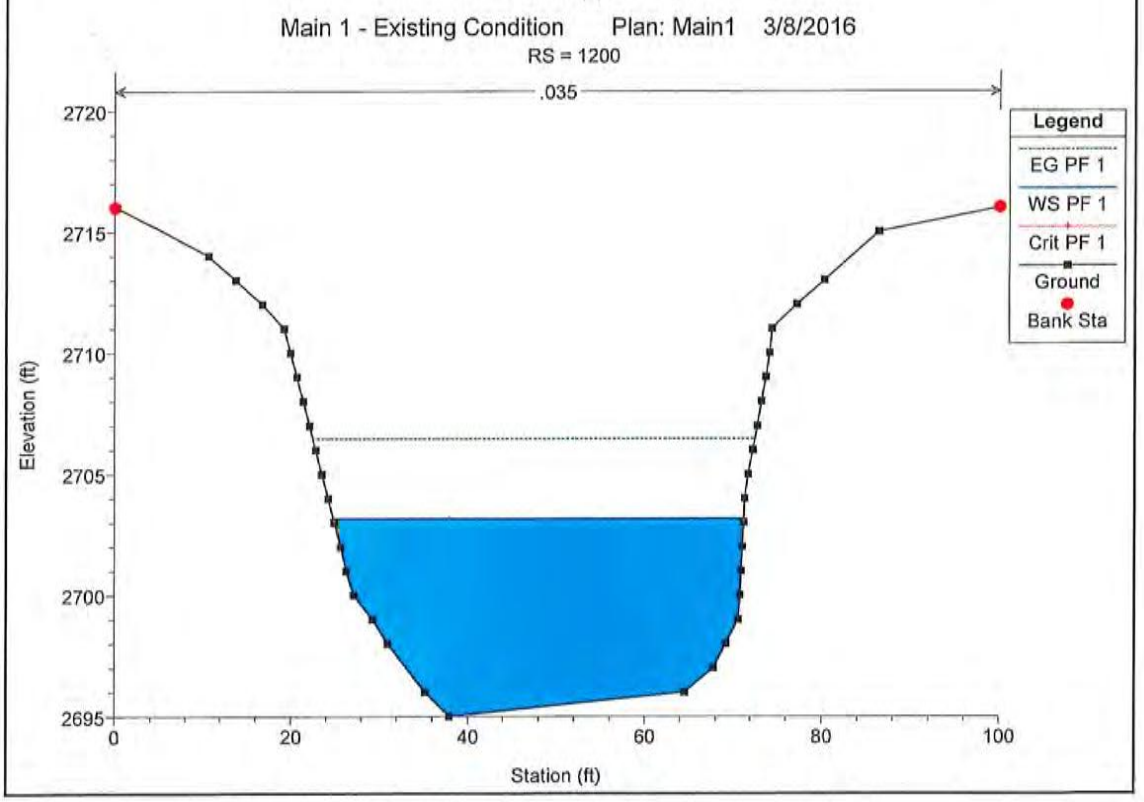
Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-7667.372	2689.838	10.401	2700.239	4497.00	30.88	14.81	2715.05	.80	12.00	14.00	12.000	14.000	.00	0 .0
25.650	.0463					.0136	.35	11.20	1.69	6.65	.015	.00	.00	BOX
-7641.722	2691.026	10.908	2701.934	4497.00	29.45	13.46	2715.40	.72	12.00	14.00	12.000	14.000	.00	0 .0
20.199	.0463					.0121	.24	11.63	1.57	6.65	.015	.00	.00	BOX
---------- WARNING - Flow depth near top of box conduit ----------														
-7621.523	2691.961	11.441	2703.402	4497.00	28.08	12.24	2715.64	12.00	12.00	14.00	12.000	14.000	.00	0 .0
15.573	.0463					.0107	.17	12.00	1.46	6.65	.015	.00	.00	BOX
---------- WARNING - Flow depth near top of box conduit ----------														
-7605.950	2692.682	12.000	2704.682	4497.00	26.77	11.13	2715.81	12.00	12.00	14.00	12.000	14.000	.00	0 .0

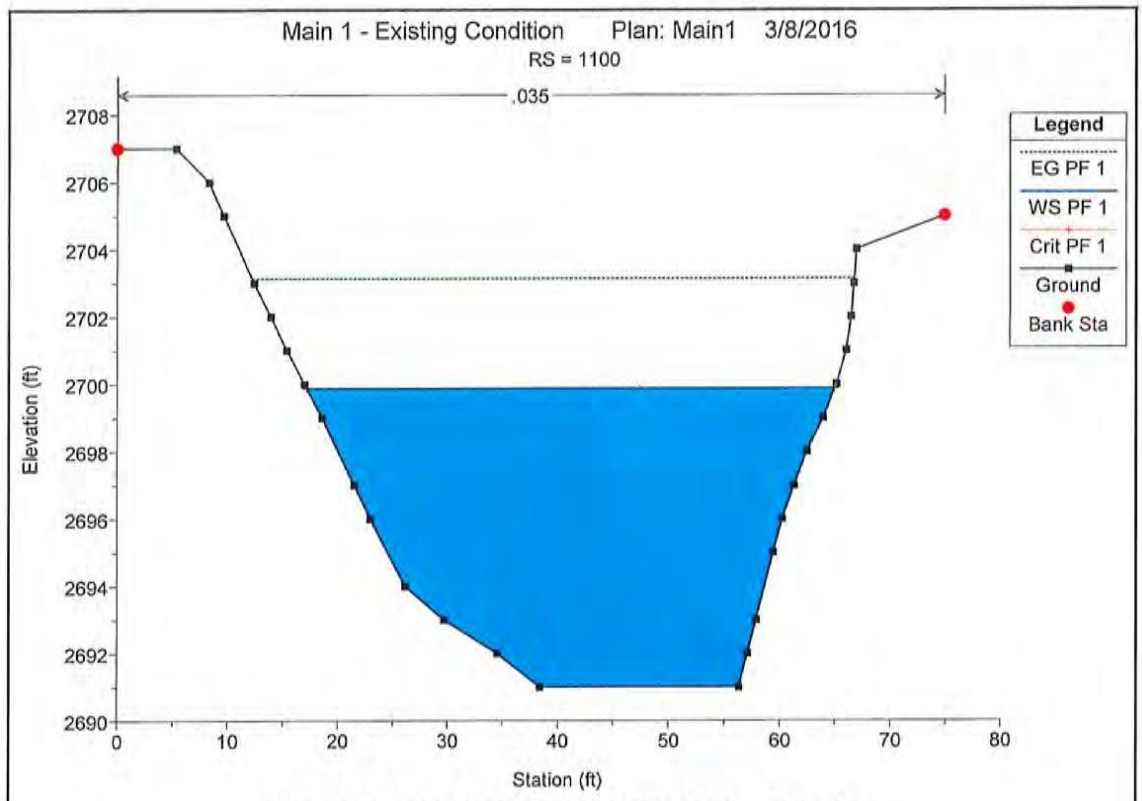
HEC-RAS Plan: Main1 River: Unnamed Wash Reach: Main1 Profile: PF 1

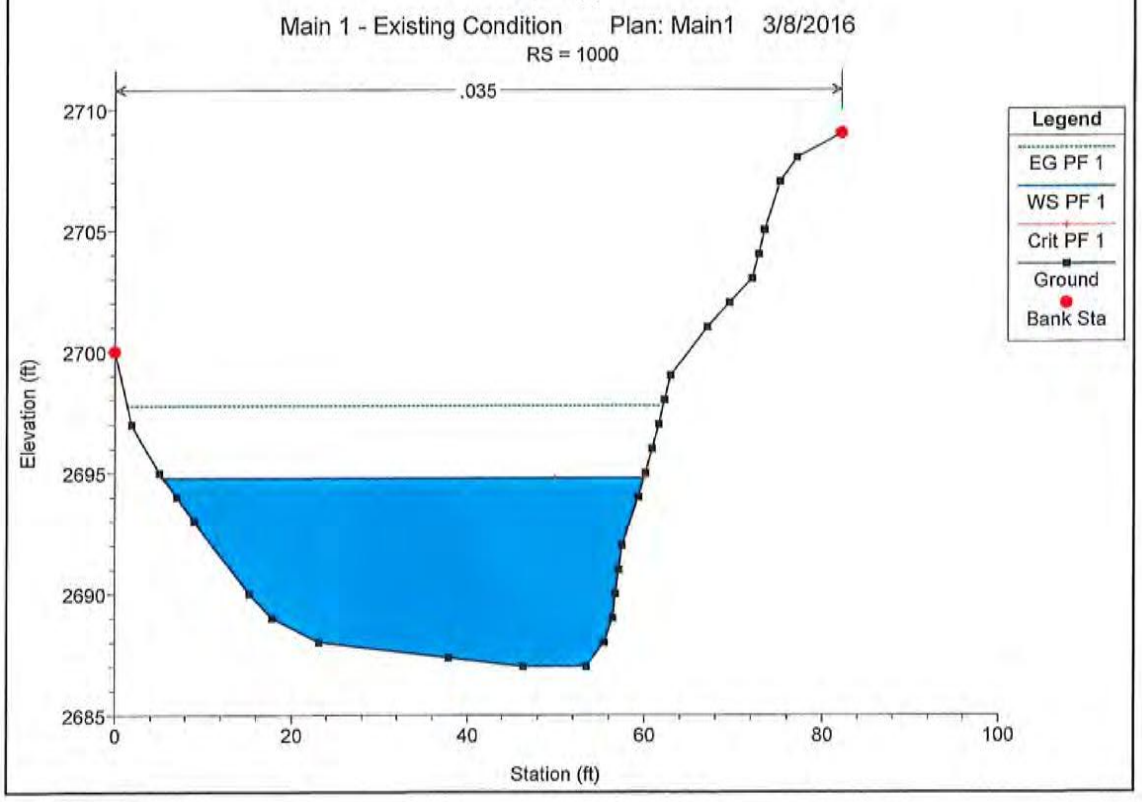
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Main1	1300	PF 1	4497.00	2699.00	2706.55	2706.55	2709.24	0.010951	13.15	342.03	63.72	1.00
Main1	1200	PF 1	4497.00	2695.00	2703.15	2703.15	2706.47	0.011510	14.61	307.73	46.43	1.00
Main1	1100	PF 1	4497.00	2691.00	2699.87	2699.87	2703.14	0.011290	14.51	309.95	47.76	1.00
Main1	1000	PF 1	4497.00	2687.00	2694.78	2694.78	2697.78	0.011315	13.90	323.58	54.48	1.00
Main1	900	PF 1	4497.00	2683.00	2691.71	2691.71	2695.10	0.011264	14.78	304.32	45.03	1.00
Main1	800	PF 1	4497.00	2679.00	2688.14	2688.14	2691.31	0.011001	14.29	314.70	49.64	1.00
Main1	700	PF 1	4497.00	2676.00	2684.71	2684.71	2687.97	0.011132	14.49	310.43	47.76	1.00
Main1	600	PF 1	4497.00	2674.00	2685.35	2681.70	2686.27	0.002268	7.71	583.25	132.04	0.48
Main1	500	PF 1	4497.00	2672.00	2685.53	2679.19	2685.89	0.000851	4.77	943.02	139.22	0.32
Main1	400	PF 1	4497.00	2671.00	2685.57	2677.65	2685.82	0.000666	3.95	1138.68	212.11	0.30
Main1	300	PF 1	4497.00	2669.00	2685.57	2676.07	2685.75	0.000362	3.34	1347.90	171.19	0.21
Main1	200	PF 1	4497.00	2668.00	2683.47	2683.47	2685.46	0.013580	11.30	397.79	103.22	1.01

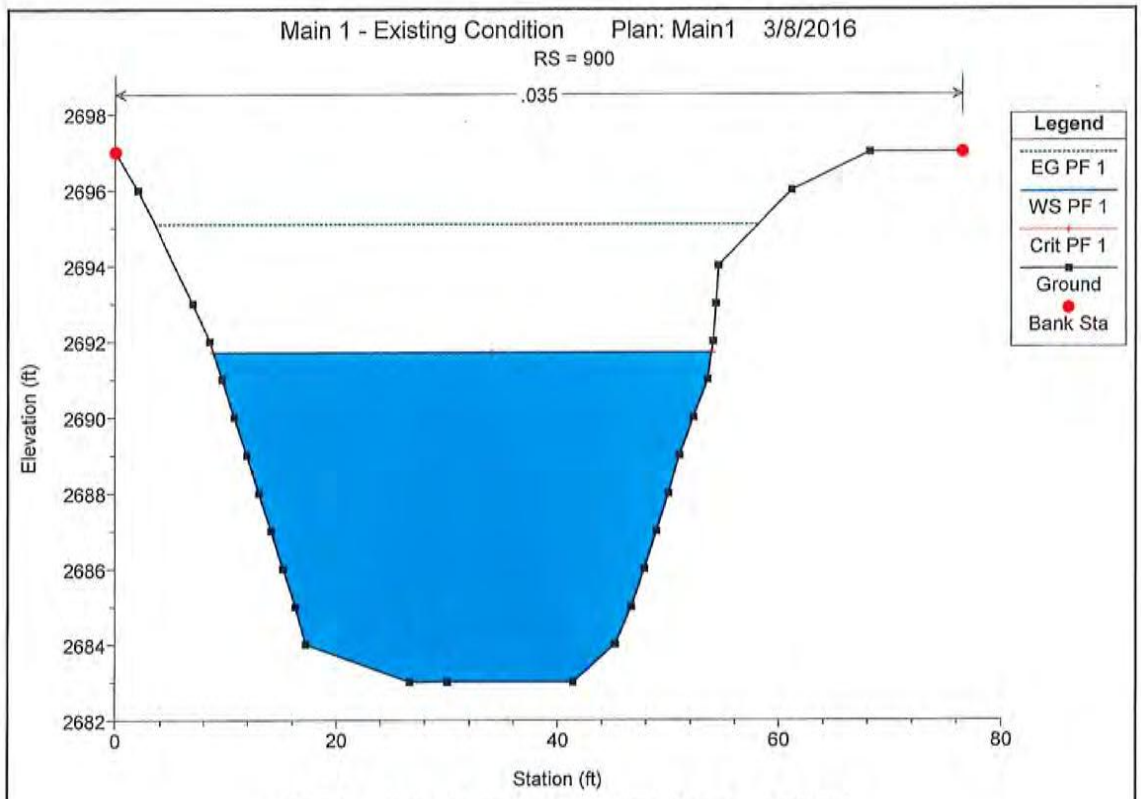

Main 1 - Existing Condition Plan: Main1 3/8/2016
Unnamed Wash Main1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
2710
2700
2690
2680
2670
2660
Main Channel Distance (ft)
0
200
400
600
800
1000
1200
1400
1600
1800
300
400
500
600
700
800
900
1000
1100
1200
1300

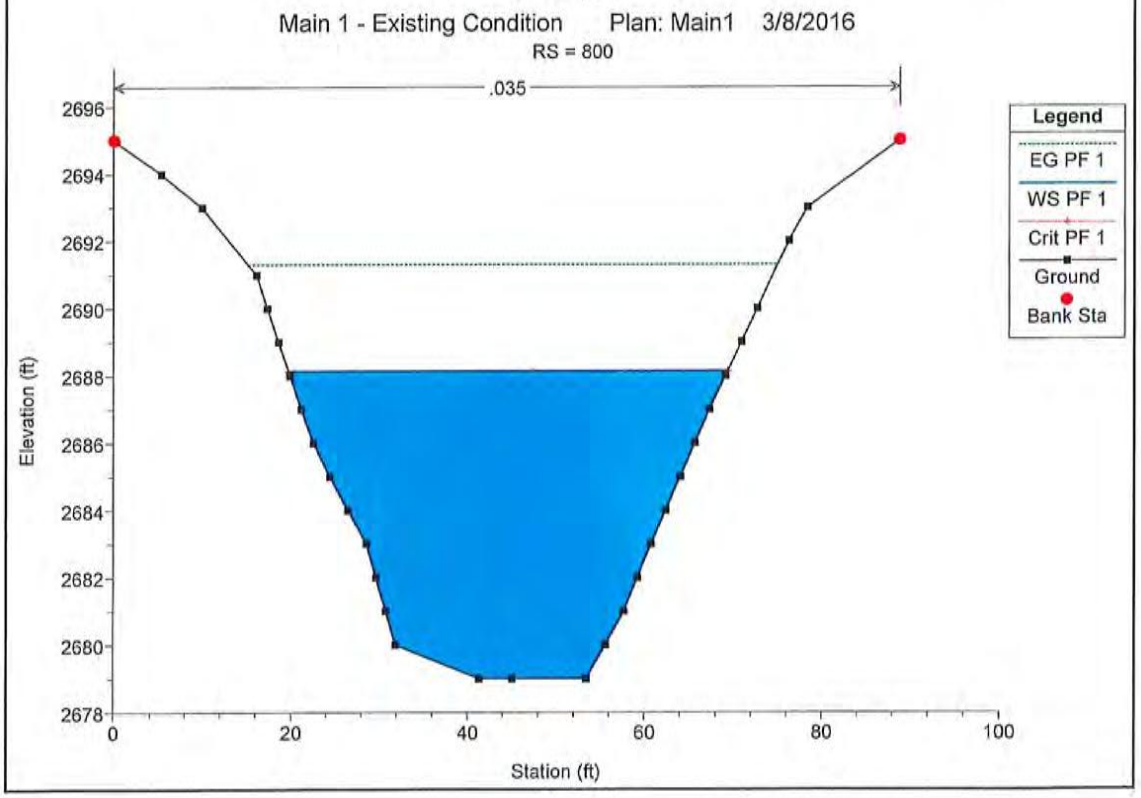

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 1300
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2720
2715
2710
2705
2700
2695
0
20
40
60
80
100
Station (ft)

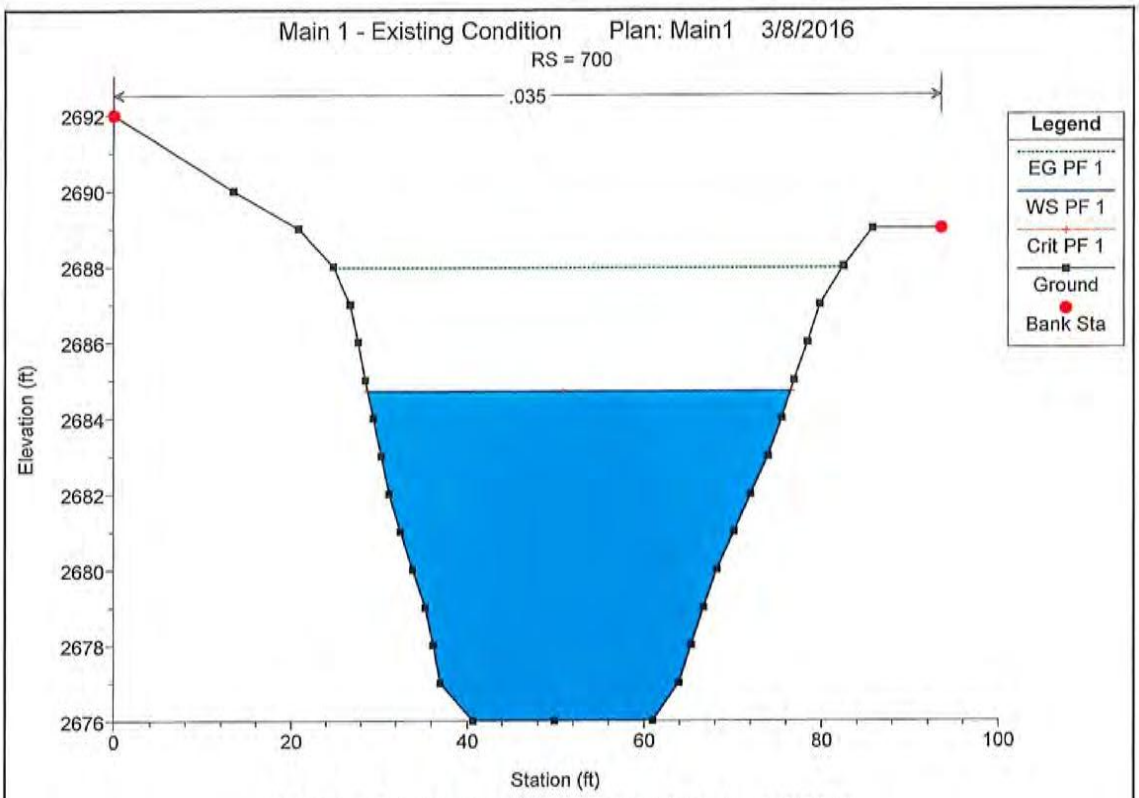

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 1200
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2720
2715
2710
2705
2700
2695
0
20
40
60
80
100
Station (ft)

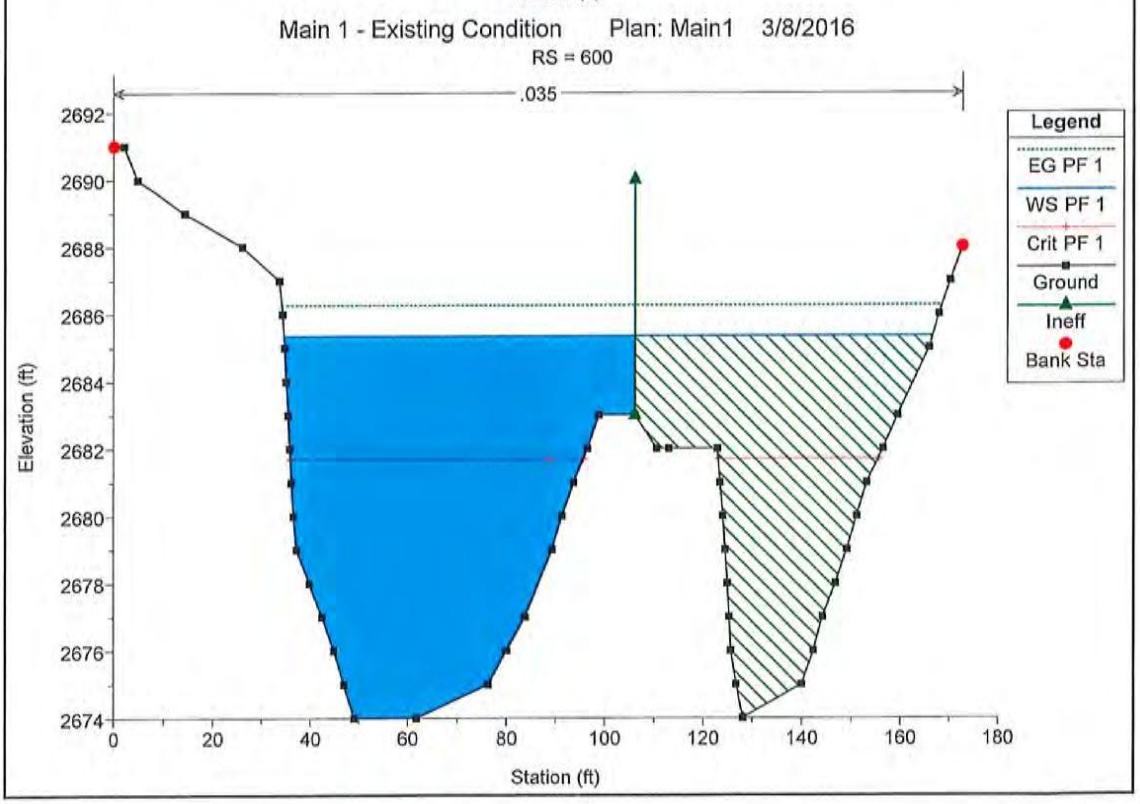

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 1100
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

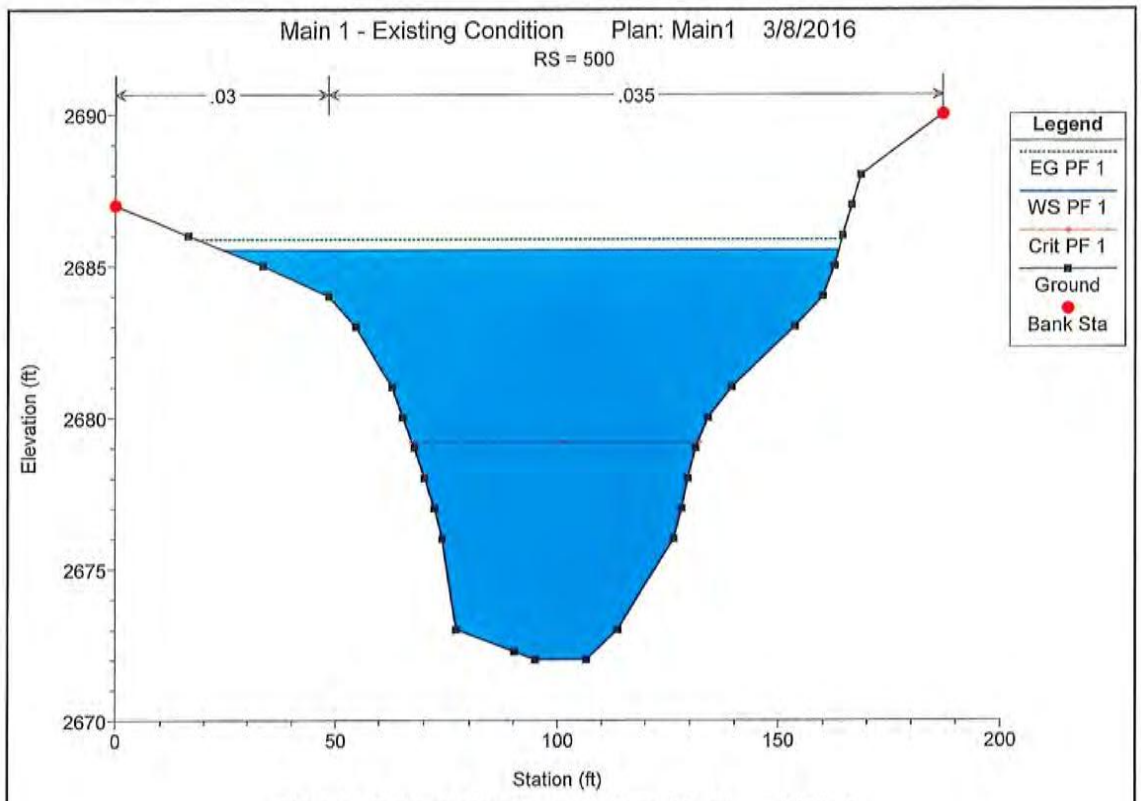

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 1000
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

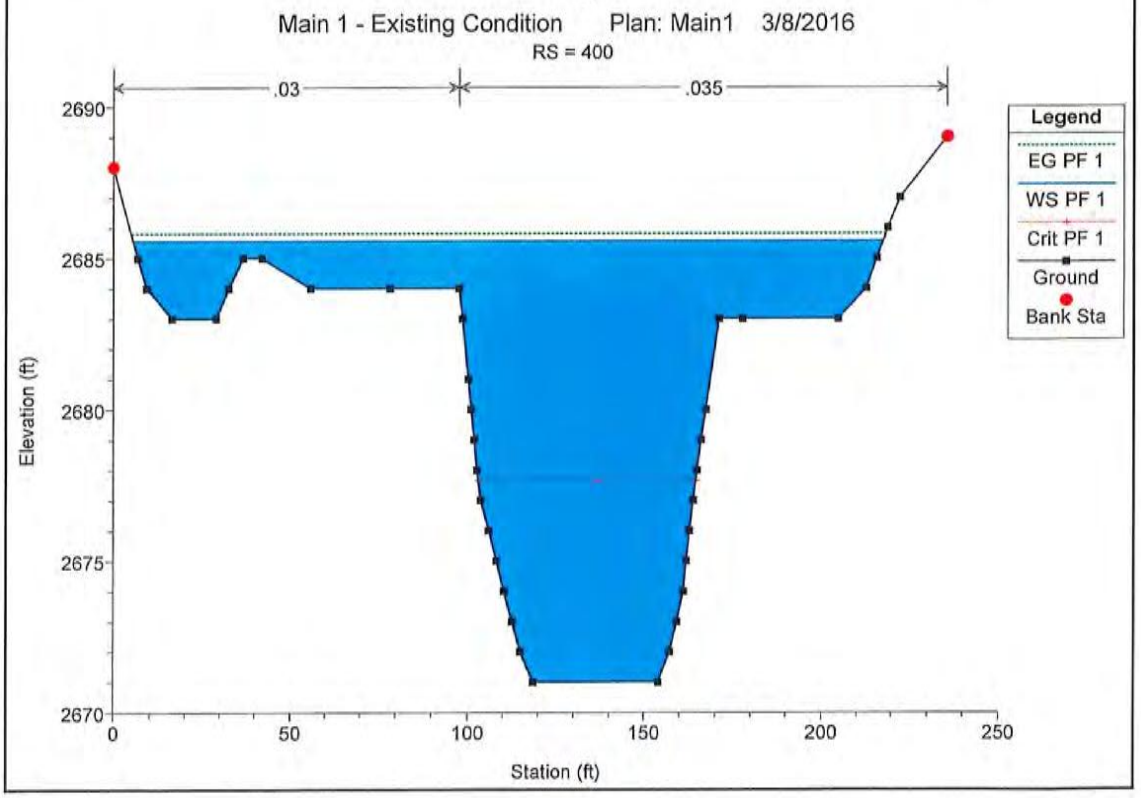

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 900
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

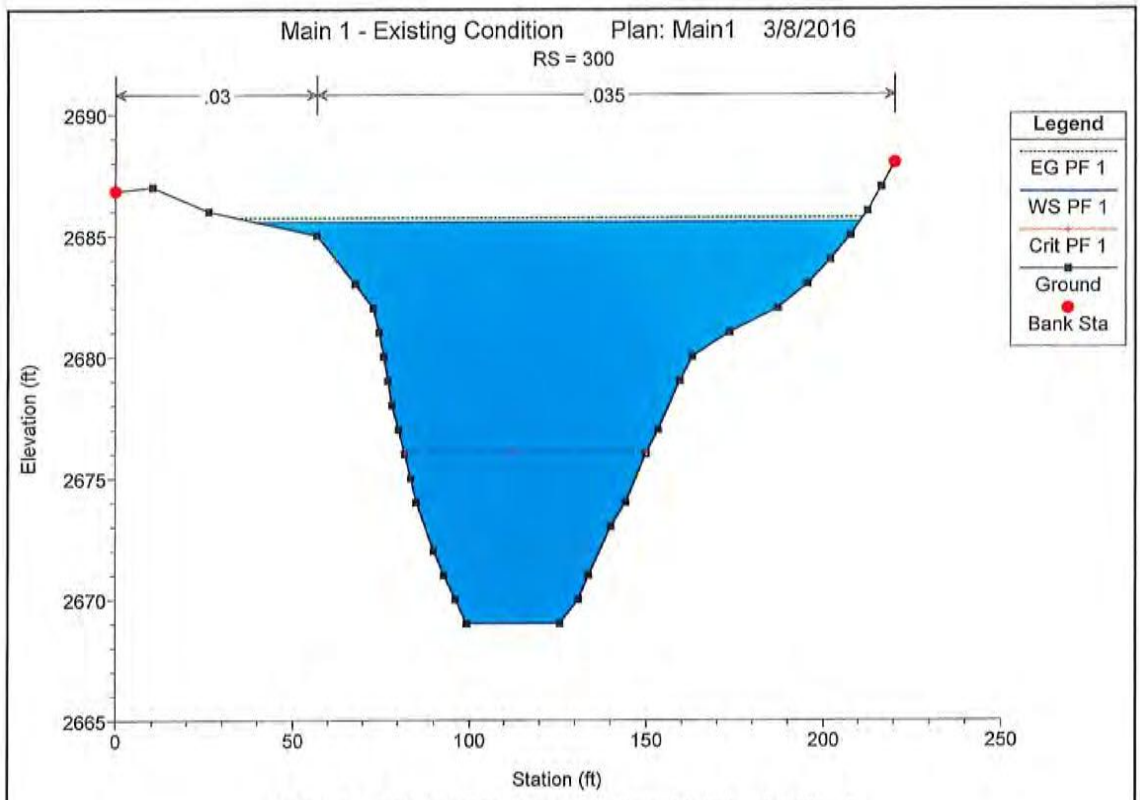

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 800
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

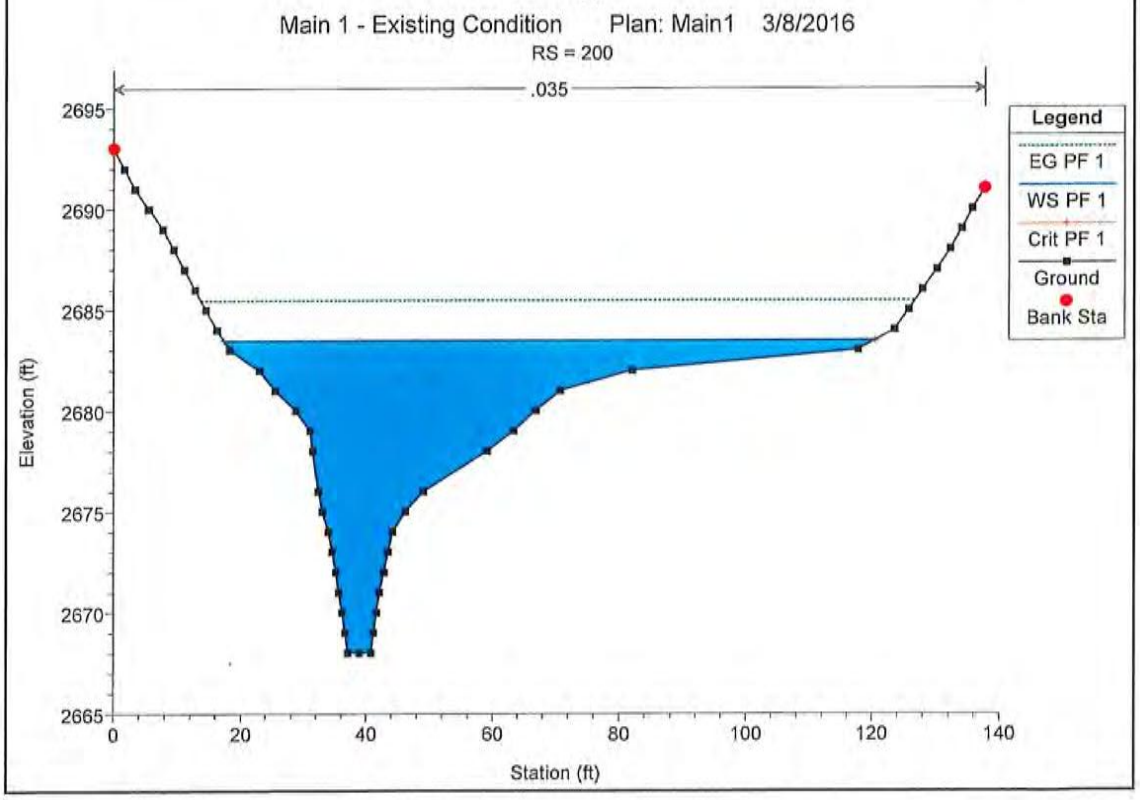

Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 700
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 600
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 500
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2690
2685
2680
2675
2670
0
50
100
150
200
Station (ft)


Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 400
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2690
2685
2680
2675
2670
0
50
100
150
200
250
Station (ft)


Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 300
.03
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2690
2685
2680
2675
2670
2665
0
50
100
150
200
250
Station (ft)


Main 1 - Existing Condition Plan: Main1 3/8/2016
RS = 200
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2695
2690
2685
2680
2675
2670
2665
0
20
40
60
80
100
120
140
Station (ft)

```
                    HEC-RAS Version 4.1.0 Jan 2010
                     U.S. Army Corps of Engineers
                    Hydrologic Engineering Center
                          609 Second Street
                          Davis, California

          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X       X
          X     X  X        X    X       X   X    X    X       X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Main 1 - Existing Condition
Project File : EXIST3.prj
Run Date and Time: 3/8/2016 12:28:40 PM

Project in English units

PLAN DATA

Plan Title: Main1
Plan File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Supp01\01-Main1\EXIST3.p02

Geometry Title: Main1
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Supp01\01-Main1\EXIST3.G01

Flow Title : Main1
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Supp01\01-Main1\EXIST3.F01

Plan Summary Information:

Number of:	Cross Sections =	12	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Main1
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Supp01\01-Main1\EXIST3.F01

Flow Data (cfs)

River	Reach	RS	PF 1
Unnamed Wash	Main1	1300	4497

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed Wash	Main1	PF 1	Critical	Known WS = 2672.17

GEOMETRY DATA

Geometry Title: Main1
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\HEC-RAS\02-Supp01\01-Main1\EXIST3.G01

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1300

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2712	4.99	2710	14.86	2706	17.55	2705	22.21	2704
27.42	2703	29.49	2702	31.48	2701	36.81	2700	41.74	2699
45.01	2699	64.83	2699	67.91	2700	70.18	2701	71.28	2702
72.3	2703	73.52	2704	75.03	2705	76.39	2706	77.9	2707
81.18	2709	84.68	2711	89.2	2713	90.51	2714	91.21	2715
91.91	2716	92.61	2717	93.31	2718	94.06	2719		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	94.06	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	94.06	170	195.8	223.9	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1200

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2716	.24	2716	10.59	2714	13.66	2713	16.72	2712
19.16	2711	19.86	2710	20.62	2709	21.34	2708	22.05	2707
22.77	2706	23.47	2705	24.18	2704	24.9	2703	25.61	2702
26.28	2701	27.17	2700	29.23	2699	30.97	2698	35.17	2696
37.91	2695	64.52	2696	67.8	2697	69.22	2698	70.64	2699
70.83	2700	70.92	2701	71.09	2702	71.2	2703	71.31	2704
71.7	2705	72.21	2706	72.72	2707	73.17	2708	73.65	2709
74.08	2710	74.34	2711	77.17	2712	80.26	2713	86.35	2715
100	2716								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	100	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	100	199.59	208.99	220.51	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1100

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2707	5.35	2707	8.38	2706	9.68	2705	12.44	2703
13.93	2702	15.38	2701	17.01	2700	18.58	2699	21.52	2697
22.94	2696	26.14	2694	29.68	2693	34.53	2692	38.4	2691
56.38	2691	57.13	2692	57.9	2693	59.43	2695	60.24	2696
61.29	2697	62.43	2698	63.9	2699	65.12	2700	66.01	2701
66.45	2702	66.68	2703	66.92	2704	74.91	2705		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	74.91	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	74.91	173.12	189.13	202.7	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 1000

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2700	1.85	2697	4.99	2695	7.03	2694	9.01	2693
15.23	2690	17.81	2689	23.14	2688	37.9	2687.36	46.38	2687
53.45	2687	55.47	2688	56.45	2689	56.76	2690	57.1	2691
57.5	2692	59.29	2694	60.1	2695	60.84	2696	61.57	2697
62.25	2698	62.94	2699	67.06	2701	69.55	2702	72.11	2703
72.82	2704	73.47	2705	75.18	2707	77.09	2708	82.18	2709

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	82.18	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	82.18	200.05	199.88	200.05	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 900

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2697	2.01	2696	6.96	2693	8.56	2692	9.68	2691
10.78	2690	11.92	2689	13	2688	14.12	2687	15.2	2686
16.3	2685	17.24	2684	26.67	2683	30.04	2683	41.4	2683
45.22	2684	46.68	2685	47.87	2686	48.94	2687	50.02	2688
51.05	2689	52.27	2690	53.58	2691	54.05	2692	54.3	2693
54.53	2694	61.14	2696	68.17	2697	76.52	2697		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	76.52	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	76.52	200.06	199.87	200.06	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 800

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2695	5.28	2694	9.97	2693	16.15	2691	17.35	2690
18.64	2689	19.91	2688	21.18	2687	22.6	2686	24.45	2685
26.51	2684	28.59	2683	29.67	2682	30.77	2681	31.87	2680
41.31	2679	45.06	2679	53.43	2679	55.64	2680	57.69	2681
59.22	2682	60.74	2683	62.39	2684	64.07	2685	65.7	2686
67.32	2687	69.12	2688	70.94	2689	72.73	2690	76.3	2692
78.37	2693	88.81	2695						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	88.81	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	88.81	200	199.91	200	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 700

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2692	13.46	2690	20.83	2689	24.82	2688	26.72	2687
27.64	2686	28.5	2685	29.4	2684	30.34	2683	31.24	2682
32.5	2681	33.91	2680	35.36	2679	36.22	2678	37	2677
40.67	2676	49.89	2676	60.98	2676	63.89	2677	65.31	2678
66.7	2679	68.22	2680	70.18	2681	72.05	2682	73.98	2683
75.51	2684	76.92	2685	78.38	2686	79.79	2687	82.47	2688
85.76	2689	93.54	2689						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	93.54	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	93.54	105.58	90.05	91.05	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 600

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2691	2.03	2691	4.75	2690	14.29	2689	26.04	2688
33.69	2687	34.32	2686	34.69	2685	35.04	2684	35.4	2683
35.71	2682	36.05	2681	36.46	2680	37.14	2679	39.75	2678
42.44	2677	44.85	2676	46.95	2675	49.06	2674	61.8	2674
76.28	2675	80.1	2676	83.77	2677	89.32	2679	91.29	2680
93.62	2681	96.54	2682	98.84	2683	106.09	2683	110.53	2682
112.97	2682	122.92	2682	123.43	2681	124.01	2680	124.46	2679
124.94	2678	125.31	2677	125.68	2676	126.77	2675	128.15	2674
139.97	2675	142.29	2676	144.19	2677	146.82	2678	149.09	2679
151.09	2680	153.17	2681	156.53	2682	159.47	2683	165.89	2685
167.92	2686	170.23	2687	172.74	2688				

```
Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .035        0     .035   172.74     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
             0  172.74             165.96  163.56  169.79             .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
  106.09  172.74    2690       F

CROSS SECTION


RIVER: Unnamed Wash
REACH: Main1                RS: 500

INPUT
Description:
Station Elevation Data      num=       29
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     2687    16.29     2686    33.47     2685    48.37     2684    54.57     2683
   62.81     2681     65.1     2680    67.73     2679    70.01     2678    72.24     2677
   73.94     2676    77.08     2673    90.18  2672.27    94.92     2672    106.5     2672
  113.63     2673   126.37     2676   128.11     2677   129.52     2678   131.24     2679
  134.08     2680   139.43     2681   153.77     2683   159.91     2684   162.55     2685
  164.37     2686   166.37     2687   168.53     2688   187.05     2690

Manning's n Values          num=        2
     Sta    n Val      Sta    n Val
       0      .03    48.37     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
             0  187.05              58.23   51.31   62.51             .1        .3

CROSS SECTION


RIVER: Unnamed Wash
REACH: Main1                RS: 400

INPUT
Description:
Station Elevation Data      num=       41
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0  2688.01      6.8     2685     9.24     2684    16.28     2683    28.94     2683
   32.59     2684    36.71     2685    41.98     2685    55.92     2684    78.44     2684
   97.61     2684    98.46     2683   100.13     2681    100.9     2680   101.76     2679
  102.54     2678   103.66     2677   105.88     2676   108.08     2675   110.35     2674
  112.62     2673   114.93     2672   118.66     2671   154.09     2671   157.32     2672
  159.33     2673   161.13     2674   161.97     2675   162.88     2676   163.89     2677
  164.96     2678   166.09     2679   167.41     2680   171.11     2683   177.76     2683
  204.74     2683   212.73     2684   215.85     2685   218.94     2686    222.3     2687
  235.52     2689

Manning's n Values          num=        2
     Sta    n Val      Sta    n Val
       0      .03    97.61     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
             0  235.52             116.72   99.89   88.03             .1        .3

CROSS SECTION


RIVER: Unnamed Wash
REACH: Main1                RS: 300

INPUT
Description:
Station Elevation Data      num=       35
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2686.85	10.18	2687	26.16	2686	56.92	2685	67.77	2683
72.93	2682	74.69	2681	75.93	2680	77.09	2679	78.28	2678
80.13	2677	81.83	2676	83.53	2675	85.1	2674	89.88	2672
92.95	2671	96.11	2670	99.27	2669	125.7	2669	131	2670
133.85	2671	140.06	2673	144.25	2674	149.79	2676	153.27	2677
159.33	2679	162.93	2680	173.51	2681	187.26	2682	195.52	2683
202	2684	207.73	2685	212.52	2686	216.49	2687	220.29	2688

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.03	56.92	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	220.29	145.1	100.88	52	.1	.3

CROSS SECTION

RIVER: Unnamed Wash
REACH: Main1 RS: 200

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2693	1.64	2692	3.32	2691	5.46	2690	7.61	2689
9.35	2688	11.06	2687	12.77	2686	14.47	2685	16.25	2684
18.24	2683	23	2682	25.51	2681	28.74	2680	31.03	2679
31.44	2678	32.35	2676	33	2675	33.89	2674	34.55	2673
35.14	2672	35.58	2671	36.12	2670	36.63	2669	37.08	2668
38.91	2668	40.82	2668	41.23	2669	41.7	2670	42.11	2671
42.85	2672	43.48	2673	44.25	2674	46.26	2675	49.04	2676
59.12	2678	63.36	2679	66.9	2680	70.72	2681	82.01	2682
117.78	2683	123.57	2684	125.81	2685	127.96	2686	130.18	2687
132.3	2688	134.11	2689	135.75	2690	137.7	2691		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	137.7	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	137.7	.3	.5

SUMMARY OF MANNING'S N VALUES

River:Unnamed Wash

Reach	River Sta.	n1	n2	n3
Main1	1300	.035	.035	.035
Main1	1200	.035	.035	.035
Main1	1100	.035	.035	.035
Main1	1000	.035	.035	.035
Main1	900	.035	.035	.035
Main1	800	.035	.035	.035
Main1	700	.035	.035	.035
Main1	600	.035	.035	.035
Main1	500	.03	.035	
Main1	400	.03	.035	
Main1	300	.03	.035	
Main1	200	.035	.035	.035

SUMMARY OF REACH LENGTHS

River: Unnamed Wash

Reach	River Sta.	Left	Channel	Right
Main1	1300	170	195.8	223.9
Main1	1200	199.59	208.99	220.51
Main1	1100	173.12	189.13	202.7
Main1	1000	200.05	199.88	200.05
Main1	900	200.06	199.87	200.06
Main1	800	200	199.91	200
Main1	700	105.58	90.05	91.05
Main1	600	165.96	163.56	169.79
Main1	500	58.23	51.31	62.51
Main1	400	116.72	99.89	88.03
Main1	300	145.1	100.88	52
Main1	200			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Unnamed Wash

Reach	River Sta.	Contr.	Expan.
Main1	1300	.1	.3
Main1	1200	.1	.3
Main1	1100	.1	.3
Main1	1000	.1	.3
Main1	900	.1	.3
Main1	800	.1	.3
Main1	700	.1	.3
Main1	600	.1	.3
Main1	500	.1	.3
Main1	400	.1	.3
Main1	300	.1	.3
Main1	200	.3	.5

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Main1

River: Unnamed Wash Reach: Main1 RS: 1300 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1200 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1100 Profile: PF 1

Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 1000 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 900 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 800 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 700 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Unnamed Wash Reach: Main1 RS: 600 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Unnamed Wash Reach: Main1 RS: 300 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Unnamed Wash Reach: Main1 RS: 200 Profile: PF 1
Warning:User specified water surface is not possible for the specified flow regime. The program used critical depth as the
starting water surface.

+308.6

LETTER OF MAP REVISION (LOMR)
FOR
THE VILLAGE AT QUEENSRIDGE

619.2953

August 2006

Prepared for:

Great Wash, LLC
9755 W. Charleston Boulevard
Las Vegas, Nevada 89117
Phone: (702) 656-5955
Fax: (702) 562-0579

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

LETTER OF MAP REVISION (LOMR)
FOR
THE VILLAGE AT QUEENSRIDGE

619.2953

August 2006

Prepared for:

Great Wash, LLC
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Prepared by:

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ENGINEERS PLANNERS SURVEYORS

G. C. WALLACE, INC.

Writer's Contact Information:

804-2018

619.2953

August 23, 2006

Sacha Tohme, CFM
Revisions Coordinator
Federal Emergency Management Agency (FEMA) Depot
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304-6425

Subject: Letter of Map Revision (LOMR) for The Village at Queensridge

Dear Mr. Tohme:

G. C. Wallace, Inc. (GCW) has been contracted by Great Wash, LLC to complete a request for a Letter of Map Revision (LOMR) for a portion of an unnamed wash within The Village at Queensridge development in Las Vegas, Nevada. The project was previously named *Queensborough* in the Conditional Letter of Map Revision (CLOMR) submittal. See Figures 1 and 2 for the location of the project site. The affected Community Panel is Number 32003C 2145E, dated September 27, 2002. The following documents in support of this LOMR request are attached:

- Effective FIRM (Figure 3)
- Regional Facilities (Figure 4)
- Proposed FIRM (Figure 5)
- Annotated Firm (Figure 6)
- FEMA Forms
- Site investigation photographs
- Improvement drawings
- Operation and Maintenance Plan
- Referenced hydrologic modeling
- Check for the amount of $4,000 made payable to the National Flood Insurance Program (NFIP)

The CLOMR that preceded this LOMR request (CLOMR Case No. 05-09-0420R) was approved in August 2005. The CLOMR was based on the proposed construction of approximately 2,300 feet of dual 12-foot high by 12-foot wide reinforced concrete box culvert with outlet protection. Since the CLOMR approval, the culvert alignment was adjusted slightly near the outlet. The attached improvement plans show this updated alignment. The WSPG hydraulic modeling was updated to reflect this new alignment and showed no significant differences from the previous alignment.

1555 South Rainbow Boulevard · Las Vegas, NV 89146 · T: 702.804.2000 · F: 702.804.2299 · gcwallace.com

A site investigation confirmed that the flood control structures were built in substantial conformance with the intent of the design drawings. Therefore, based on these observations, I certify that the submittal drawings entitled: *The Village at Queensridge Culvert,* dated December 14, 2005; March 29, 2006; and August 23, 2006; all prepared by G. C. Wallace, Inc., represent as-built conditions.

If you have any questions or need additional information, please do not hesitate to contact me at (702) 804-2018.

Sincerely,

G. C. WALLACE, INC.

Michael J. Ludwig, PE
Project Manager
Flood Control Division

MJL/jj

Enclosures

c: Peter Jackson, City of Las Vegas
Roy Clark, GCW
Randall K. Gremlich, GCW

2nd Update
TO THE
TECHNICAL DRAINAGE STUDY
FOR
QUEENS BOROUGH CULVERT

619.295

February 2006

Prepared for:

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ENGINEERS PLANNERS SURVEYORS